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Vol. XX, No. 1 JANUARY, 1931

# JOURNAL
## OF THE
# AMERICAN PHARMACEUTICAL ASSOCIATION

TRADE MARK

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**THE 79th ANNUAL MEETING OF THE AMERICAN PHARMACEUTICAL ASSOCIATION WILL BE HELD IN MIAMI, FLA., DURING WEEK OF JULY 28th. HEADQUARTERS, COLUMBUS HOTEL. LOCAL SECRETARY, G. H. GROMMET, 2364 S.W. 11th ST., MIAMI.**

The 1931 Meetings of the American Association of Colleges of Pharmacy, the National Association of Boards of Pharmacy, Conferences of Pharmaceutical Association Secretaries and of Pharmaceutical Law Enforcement Officials will also be held at Miami, same time and place. The Plant Science Seminar will be held at Gainesville, Fla., during the week of July 21st.

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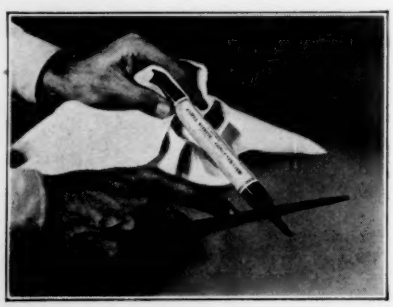

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## COMMITTEE CHAIRMEN FOR THE MIAMI A. PH. A. MEETING.

THE Local Florida Committee has arranged for a meeting in Miami on January 28th, at which time steps will be taken and plans formulated for the 79th annual meeting of the AMERICAN PHARMACEUTICAL ASSOCIATION. Pharmacists from all parts of Florida and adjoining states are expected to be present for the discussion of plans which will make the convention an outstanding success. President H. C. Christensen, Secretary E. F. Kelly and James H. Beal will attend the meeting.

Local Secretary Grommet advises that the following Committee Chairmen have been named by the Local Committee:

*Reception*, H. Jackson; *Hotels*, A. Finstad; *Finance*, I. Cliff Smith; *Registration*, Charles Likes; *Publicity*, G. E. Burwell; *Program*, R. Hailey; *Entertainment*, Lee McGarr; *Ladies*, E. W. Groover; *Veterans*, E. W. Stucky; *Membership*, Nat. Hunter; *Banquet*, M. L. Johnson; *Refreshments*, R. C. Edmonson; *Badges*, W. Scheibler; *Transportation*, L. McGarr; *Advisory*, Dr. J. H. Beal; *American Association Colleges of Pharmacy*, Dr. W. J. Husa; *National Association Boards of Pharmacy*, N. H. Hunter; *Pharmaceutical Association Secretaries*, G. E. Burwell; *Law Enforcement Officials*, J. Specht; *Plant Science Seminar*, Wm. Fossett; *Alumni and Fraternities*, Don Smith. Members of the various committees are to be announced later.

The preliminary meeting at which the appointments were made, was well attended and all present were enthused; the proceeding was conducted as a round table discussion, each one expressing his thoughts and ideas for the coming convention—these will be supplemented and arranged at the meeting on January 28th.

*The half-tone above and the one below show the Miami Sky Line from Biscayne Bay.*

WALTER D. ADAMS.

JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

VOL. XX JANUARY, 1931 No. 1

## PRESIDENT-ELECT OF THE AMERICAN PHARMACEUTICAL ASSOCIATION.

The memoirs of the Adams family of Virginia and Tennessee were written by Dr. Morgan Adams of Mississippi and from these the early data to follow have been taken. Dr. Adams is a former president of the Mississippi Dental Association, an editor of *Archives of Dentistry* and the *Southern Dental Journal;* he is chairman of the Mississippi State Committee for the World's Congress in Chicago, etc.

Notwithstanding a statement made by W. D. Adams in a letter: "A pedigree is not worth a darn if the horse can't run"—a few references will be made to his antecedents.

His grandfather was a native of Tennessee, a soldier in the Creek War under General Jackson; one of the early American writers of school books; prominent in early Tennessee Masonry. In the grandmother's lineage is General Joseph Dickson, a revolutionary soldier, member of Congress from North Carolina, at the beginning of the nineteenth century; later, he emigrated to Tennessee and was appointed to a judgeship by President Jackson. The families have been represented in the wars referred to and by a larger number, from several states, in the Confederate Service.

Walter Dickson Adams' antecedents in this country date back to John Adams, a native of Wales, who emigrated to the United States in 1740 and settled in Virginia. Walter is the son of George M. Adams and Elizabeth (Hubert) Adams, and was born at Kemp, Texas, December 31, 1871. At the age of three, having been bereft of father and mother, he was entrusted to the care of a widowed aunt until her death, when he was about twelve years old, after which time he began to shift for himself. He attended public school at Kaufman, and worked in the drug store of his brother, S. M. Adams. Later, he served a three years' apprenticeship in the print shop of the *Kaufman Sun.* In 1887 he moved to Forney and attended a private academy, and worked in the drug store of another brother,

F. M. Adams. At the age of seventeen, with the financial assistance of ten leading citizens, he established the *Forney Tribune*. The venture was successful, but desiring further education he sold his interest in the paper and obtained the means for a year at Texas A. & M. College, acting also as clerk in the president's office. Returning to Forney he again engaged in the newspaper business; disposing of this two years later he purchased an interest in the drug store of his brother, F. M. Adams and, later, became sole owner and has successfully continued the business for more than 37 years. December 20, 1930, Mr. and Mrs. Adams celebrated their 36th wedding anniversary. Mrs. Adams is a "helpmeet" in its truest sense; she has always taken a practical interest in the activities of her husband, in business life and association affairs. In the latter she has been most active in the Women's Auxiliary of Texas Pharmaceutical Association.

Mr. Adams has been a member of the National Association of Retail Druggists for many years, and of the AMERICAN PHARMACEUTICAL ASSOCIATION since 1913. Of the latter organization he is the vice-president and he is also vice-president of the Conference of Pharmaceutical Association Secretaries. His outstanding work has been within the Texas Pharmaceutical Association, of which he was president in 1914 and has been its secretary for the past ten years and, in addition, is the editor of the *Texas Druggist*. Included among a number of proposals and successes achieved as secretary and editor he has accomplished a great work in bringing together the records of the Association, which had been scattered, and at its fiftieth anniversary he was in position to show pictures of all former presidents and secretaries, accompanied by a sketch of each one. Those who have in like capacity searched for records that in earlier years were more or less imperfectly kept will recognize this collection of historical material as a worthwhile accomplishment.

Mr. Adams is a member of the Episcopal Church and for a number of years was a member of the Bishop's cabinet, diocese of Dallas; for four years he served as trustee of St. Mary's College, a select school for girls founded by Bishop Garrett. For seven years he was a member of the Board of Regents of the State College of Industrial Arts and, for a time, member of the Board of Managers of the State Hospital at Terrell. He is vice-president of the Retail Dealers' Allied Council of Texas, composed of nine of the largest retail organizations of the state; has been Mayor of his home town and takes a lively interest in its civic affairs, is a Rotarian and active in the Masonic bodies by which he has been distinctively honored. He is quiet and unassuming and finds his greatest recreation in work and his most satisfying pleasure in serving; his happiness responds to the friendships he makes.

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## CHAULMOOGRA IN PORTO RICO.

The first chaulmoogra trees in Porto Rico were planted by the United States Forest Service a few years ago, in one corner of the small leper colony at Trujillo Alto. The seed was brought from Siam and the East Indian Islands by the Bureau of Plant Industry. The young trees have thrived remarkably and promise to make Porto Rico not only an important nursery center but also a future source of the oil. The Federal Government maintains the Luquillo National Forest in Porto Rico, with a gross area of about 65,000 acres, administered by the United States Forest Service. Several insular forests are maintained by the local government.

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# EDITORIAL

E. G. EBERLE, EDITOR 10 West Chase Street, BALTIMORE, MD.

## WHAT MAKES A PROFESSION?

THE above title is the caption of a message by W. A. Shumaker, Editor of *Law Notes* on the cover page of the November *Bulletin of the American Medical Association;* liberty is taken in quoting it:

> "If there is such a thing as a profession as a concept distinct from a vocation it must consist in the ideals which its members maintain, the dignity of character which they bring to the performance of their duties, and the austerity of the self-imposed ethical standards. To constitute a true profession there must be ethical traditions so potent as to bring into conformity members whose personal standards of conduct are at a lower level, and to have an elevating and ennobling effect on those members. A profession cannot be created by resolution or become such over night. It requires many years for its development, and they must be years of self-denial, years when success by base means is scorned, years when no results bring honor except those free from the taint of unworthy methods."

When the United States entered the war the writer of this comment prepared an article under the caption of "Loyalty to the Country and to Pharmacy.[1]" Parts of the article bearing on pharmacy fit in with the foregoing and the title of the comment and are deemed timely and, therefore, reprinted. A concordant guide, prepared by the author, served as the introductory and text:

To respect my country, my profession and myself. To be a loyal citizen; to speak of my country with praise and act always as a trustworthy custodian of its good name. To be loyal to pharmacy and speak of its service with sincerity and conviction that the calling is worthy of my attachment and I a trustworthy votary. To be devoted to the cause of pharmacy, lend my best efforts to its uplift and advancement. To promote association work and thereby promote the service of pharmacy. To be a pharmacist deserving of the respect and confidence of those whom I serve. To look upon its service as an opportunity to be seized with joy and make the most of, and not as a painful drudgery to be reluctantly endured. To believe in pharmacy heart and soul, to be optimistic relative to its mission and convey assurance of its importance to those who are served thereby.

Pharmacy's most essential attribute to-day is optimism, because the best interests of pharmacy demand it: it means more than it ever did. No matter how different our views may be relative to the stock and conduct of the drug store, as far as pharmacy is concerned, there must be a unison of thought and action. The diverse drug interests in a sense may be viewed in the light of disintegrating forces and the coöperation of them results in centralizing or unifying them. We have pharmacists with different viewpoints, some inclining to what is denominated commercial and others to what is termed the professional side of their business. There is no more honorable engagement than the conduct of business on the high plane of honor and integrity, and it is not very honorable for anyone to pursue professional lines without due and sincere regard of the obligations assumed. Whether pharmacy is the profit-yielding part of a drug business or not, the thing

[1] Pennsylvania Pharmaceutical Association, 1918.

is to participate loyally and enthusiastically in the efforts to elevate and conform the commercial and professional status of the calling.

Pharmacy of the drug stores bears a relation to the ideals of the pharmacist; they characterize not only the individual pharmacy but have a powerful influence on pharmacy at large and the service rendered by it. Pharmacy is whatever we make it and represents our belief in it.

The layman's estimate of pharmacy is based largely upon that which pharmacists *exhibit;* they are not in position to render judgment anent what pharmacists *may think* of pharmacy. All the world may be willing to admit that pharmacy once had an enviable reputation, but most of the world will insist that this reputation not only be maintained, but improved. It may be advisable to remind the public of the past record of pharmacy, but they are most concerned with its present status and service. This is our opportunity and our duty—let us direct our energies, hopes and desires accordingly.

---

## ALCOTATE AS A DENATURANT.

ALCOTATE has been described as a compound with an odor of garlic crossed with decayed eggs. If that is descriptive, its taste and odor should certainly render it unfit for beverage purposes, but there is no accounting for taste and human frailty.

Alcotate is said to be non-toxic, inseparable from the alcohol with which it is mixed, abundant and obtainable from more than one source. Its introduction and approval as a denaturant may induce a more extended exploitation of methanol in the industries, in other applications which research may develop, or the loss to the affected industry will be considerable.

The new denaturant displaces one which has resulted in effects which have provoked questionings relative to its employment; those who have directed its use will feel relieved because of the dire effects which followed the drinking of preparations containing it by those who crave alcoholics and seek to satisfy the craving at the risk of impaired health or loss of life. It is not the aim of this comment to further discuss that phase.

Alcotate will be used in completely denatured alcohol only, therefore, its introduction will not interfere with the manufacture of products wherein the odor would be objectionable.

---

## BETTER TIMES AHEAD.

SECRETARY Robert P. Lamont on January 1st issued a statement to the press from which the following is quoted:

"That we are now approaching such a period is indicated by several significant facts. On the one hand savings deposits have been progressively accumulating, while business written by life insurance companies has been maintaining a fairly even pace and has reached a total for the year almost equal to the high level of 1929 and above the total for 1928. At the same time stocks of departments stores have been sharply reduced and there are some evidences of recent expansion of retail buying. While it is impossible to forecast at what time unmistakable evidences of improvement in business will occur, it is clear that we have reached a point where cessation of further declines and beginning of recovery may reasonably be expected.

"In a review of business activity in 1929, which was issued a year ago, attention was called to the high level of industrial output for the year as a whole and to the fact that during the closing months activity in some lines of business was in recession. 'It is impossible, of course,' the statement concluded, 'to forecast what temporary ups and downs may occur, but the nature of the economic development of the United States is such that one may confidently predict for the long run a continuance of prosperity and progress.' Despite the sharp curtailment of economic activity during the last year no evidence has appeared which would justify a revision of this statement. There can be no doubt that the inherent strength of our economic structure will enable our country to lead the world in a vigorous recovery from the present depression as we have done in the past."

It is to be hoped that what Secretary Lamont said will come to pass, and that the depression in business may be a lesson, if not a blessing in disguise. Too many have sought to make gain on the other man's investment or labor; there has always been a large class who ignore the law of service, and during the past ten or fifteen years its numbers have increased. Machinery has brought about overproduction and it may be necessary to adjust supply and production with needs which will permit of profit; increased overhead also has had something to do with diminished profits and so there are many problems which are being discussed now that were ignored during the period of more satisfactory conditions. What applies to other activities applies as well to the drug business, to pharmacy, to professions as well as commercial enterprises. The law of service is to be considered in the adjustment of affairs, and creative energy which characterizes our people; fewer laws and better observance of them, less inflation and imagination are essential for establishing better times. Strengthened coöperation of the Government and the people is expected and hoped for.

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## PRELIMINARY WORK ON NATIONAL DRUG STORE SURVEY STARTED.

A FIRST active step in carrying out the scientific study of drug store merchandising methods planned by the Bureau of Foreign and Domestic Commerce in coöperation with the National Drug Store Survey Committee will be taken with the departure to-day of a group of trade analysts of the department for St. Louis, where the survey is to be made. Mr. Wroe Alderson, Business Specialist of the Bureau of Foreign and Domestic Commerce, is in charge of the party which is to do the reconnaissance work for the survey. Other members are Mr. W. H. Meserole, Mr. Nelson A. Miller and Mr. John R. Bromell of the same Bureau.

The National Drug Store Survey is a part of the general campaign of the Commerce Department to aid American business to determine the sources of waste in distribution which is estimated to cost American business from $8,000,000,000 to $10,000,000,000 each year. The survey will be carried out along the general lines of the grocery store survey which was recently made by the department in Louisville, Kentucky.

The preliminary work on the drug survey will include the selection of the ten metropolitan drug stores and one small-town store which are to be used as the laboratories for this analysis of drug retailing methods. In some instances advance installation of additional recording methods will be advised, and a measurement of warehouse facilities is planned. The Commerce Department representa-

tives will also advise with the local committees in charge of the survey to work out financial and other preliminary details.—*Bulletin of the Department of Commerce*, January 5, 1931.

The National Drug Store Survey is of far-reaching importance. Editorial references have heretofore been made—see July JOUR. A. PH. A., page 674 and the December number, page 1280.

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## FLUECKIGERIANA.*

BY EDWARD KREMERS.

VI. Flueckiger letters to Power, 1882–1890.

Strassburg, Sept. 16, 1885.

MY DEAR FRIEND:

I must apologize for not having sooner replied to yours of Aug. 5th, which I found on my desk on my return from Switzerland (1). Many thanks for the pamphlets (2) dedicated to the meeting of German Naturalists; they show that you are in good progress.

As to the "Grundlagen" (3) there is no objection if you like to translate them; both the authors would be much pleased and the publisher informs me that he is willing to have the engravings reproduced, for an American publisher, on reasonable terms.

The "Pharmaceutische Chemie" is in slow progress, owing to my rather uncertain health (4); I can no longer work in the same way as a few years ago, being frequently suffering more or less.

It will certainly take one year more to revise the whole; I have as yet arrived at the essential oils.

As to Mr. Foster's paper on "The Medicinal Plants of Wisconsin" in your contributions (5) it would be interesting to discuss whether *Sinapis, Althaea, Tussilago Farfara, Inula Helenium, Artemisia Absinthium* can with good reason be considered as indigenous to your State (6).

I see you are quite correct with regard to chloral hydrate; it is a mistake, which I am very glad to correct.

18 Sept.

The meeting took just, with great satisfaction, notice of your "Contributions No. 1" and directed me to acknowledge very thankfully and respectfully the receipt of the same, congratulating you to this very first step and wishes good progress to you and your Department.

Yours very truly,

F. A. FLUECKIGER.

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(1) Apparently Flueckiger had been spending the summer vacation in Switzerland, his native country.

(2) Flueckiger here has reference to No. 1 of the Contributions of the Department of Pharmacy of the University of Wisconsin. In a previous letter he had informed Power of the meeting of the Verein deutscher Naturforscher und Aerzte to be held in Strassburg in 1885 and of the proposed organization of a section devoted to Pharmacy. He had also asked his former pupil to send a contribution or two. It was, no doubt, in response to this invitation that Power had the graduation theses of his first class, also a few other papers by himself and Professor Trelesse, then Professor of Botany, published. (See also Note No. 6.)

(3) Flueckiger u. Tschirch, "Grundlagen der Pharmacognosie, Einleitung in das Studium der Rohstoffe des Pflanzenreiches" had appeared in 1885. It constituted the second edition of Flueckiger's "Grundlagen der Warenkunde: Einleitung in das Studium der Pharmacognosie" of 1873. The English translation by Power, "Principles of Pharmacognosy; an introduction to the study of the crude substances of the vegetable kingdom" appeared in 1887.

(4) At the time of writing Flueckiger was only 57 years old.

(5) Charles A. Foster, The medicinal plants of the State of Wisconsin, page 7 of "Contributions from the Department of Pharmacy, University of Wisconsin, No. 1, 1885. Dedicated to the Pharmaceutical Section of the Society of German Naturalists. In Convention at Strassburg, Germany, September 17–22, 1885." Foster does not use the word indigenous. His statement reads: "In regard to plants which have escaped from cultivation, only those which are proven beyond doubt to have become naturalized have been included."

(6) During the interval the Verein deutscher Naturforscher und Aerzte had met in Strassburg and the reorganized "Sektion: Pharmacie" which had to struggle for its existence was no doubt pleased to receive a contribution from abroad for the first meeting.

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* Continued from December JOUR. A. PH. A., 1930, page 1278.

# SCIENTIFIC SECTION

## A TOXICOLOGICAL INVESTIGATION OF CHLORAL HYDRATE.

BY L. W. RISING AND E. V. LYNN.

One of the most conspicuous deficiencies in the toxicological knowledge regarding chloral hydrate is the lack of information on its stability in the body after death. Analysts have long been in disagreement as to the length of time after death in which the aldehyde could still be isolated from the cadaver and tested for quantitatively, or even qualitatively. There is no experimental data available to indicate the probable curve of disappearance of the drug when in contact with organic tissue.

Knowledge is also lacking about the effect of certain common tissue preservatives or the effect of putrefaction on the stability of chloral hydrate. It is obvious that such information would be of great value in medico-legal cases.

This investigation was initiated in order that such data might be made available. It was decided to make a series of quantitative determinations at intervals of a month or longer on specimens of organic material containing the hypnotic. Some of the specimens were to be preserved with the various preserving agents, and others left unpreserved and allowed to undergo natural putrefactive changes. The general plan was to subject the chloral hydrate as nearly as possible to all of the conditions which it might encounter if the body containing it was embalmed, exposed to the natural action of putrefaction, or the organs removed for analysis and preserved with the usual tissue preservatives. It was hoped that the data obtained from the quantitative analysis of such specimens would furnish certain valuable guides in forensic medicine or court cases wherein the quantitative estimation of the aldehyde was involved.

Stomachs from freshly killed sheep were used as carriers for the poison. These were minced, and weighed portions placed in 4-ounce wide-mouth bottles. Known quantities of the drug in amounts sufficient to have caused death were introduced and thoroughly mixed. A definite amount of the preservative was then added and each bottle stoppered and sealed with paraffin. The preservatives used were alcohol, a one per cent solution of corrosive sublimate, a saturated solution of arsenic trioxide, a ten per cent solution of formaldehyde, and embalmer's cavity fluid.[1] The samples which were to be permitted to decompose were treated in a like manner, except that no preservative was added.

In all, enough specimens were arranged so that there were three complete sets of bottles containing the poison in contact with one or no preservative. This permitted during the period of the investigation three quantitative determina-

[1] The formula for the cavity fluid is approximately as follows:

| | | |
|---|---|---|
| Absolute alcohol | (Volume) | 35.00 per cent |
| Methyl alcohol | (Volume) | 14.70 per cent |
| Glycerin | (Volume) | 2.00 per cent |
| Ethereal constituents | (Volume) | 4.00 per cent |
| Water and other constituents | (Volume) | 44.30 per cent |

tions of the poison under every condition considered. The analyses were made at approximately the ends of the first, third and seventh months of standing.

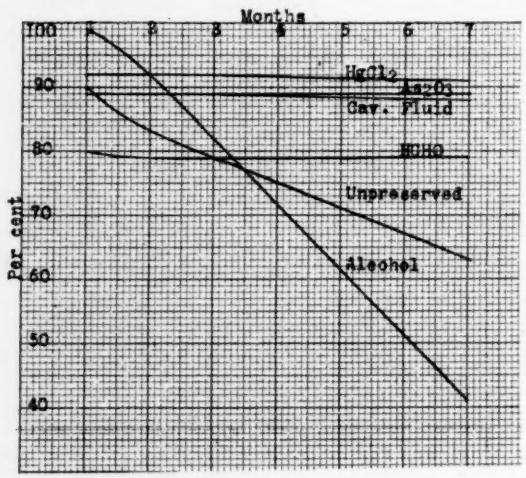


Fig. 1.

Selection of a suitable analytical procedure proved to be a difficult problem. Many of the published technics are subject to the influence of so many variable factors that they are not satisfactory as quantitative methods. On the other hand the isolation of the drug from the tissue offers no particular difficulty. It can best be accomplished by steam distillation. The operation must be continued for several hours but the complete removal of the aldehyde is assured.

The method of estimation (1) finally chosen requires that the chloral hydrate solution from the steam distillation of the organic material be refluxed for one-half hour with zinc dust. The excess zinc is dissolved with acetic acid, the solution filtered and made up to volume. The chloride thus formed is then determined in aliquots by titration with silver nitrate.

RESULTS OF ANALYSES.

| Set number | | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|---|
| Preserv. | | Alcohol | HCHO | $HgCl_2$ | $As_2O_3$ | Cav. fld. | Unpreserved |
| % found in: | I. | 99 | 80 | 92 | 89 | 89 | 90 |
| | II. | 82 | 79 | 92 | 89 | 89 | 79 |
| | III. | 41 | 79 | 91 | 89 | 88 | 63 |

I. Per cent recovered at the end of one month.
II. Per cent recovered at the end of three months.
III. Per cent recovered at the end of seven months.

## CONCLUSIONS.

It will be seen that chloral hydrate is much more stable in putrefied tissue than has been generally accepted. Toxicologists have taken it for granted that the drug would rapidly disappear (2) when subjected to putrefactive action. Such is not the case. It is highly probable that at least a year and a half would elapse before there would be complete dissociation of the aldehyde. The majority of the tissue preservatives exert an unexpected stabilizing influence on it. Bichloride of mercury is the best preserving agent to use in case of chloral poisoning. The maximum loss of the poison in specimens treated with it was less than nine per cent in the seven months.

Arsenous acid and cavity fluid are next most desirable, each yielding approximately 90 per cent of the poison at the end of the seven months. Ten per cent formaldehyde solution permitted an immediate drop of 20 per cent after which no further loss was noted. If there is a likelihood that the viscera will

have to be preserved for a long time, alcohol is a very poor substance to employ. The decline of chloral content in organic material treated with alcohol is quite rapid after the third month. Even putrefaction does not cause such a rapid loss.

The analyst apparently should recover not less than 50 per cent of the poison from tissue, regardless of the preservative used or of putrefaction, if the examination is made within six months after death.

This investigation also showed that there exists a great need for the revision of many of the methods for the quantitative determination of chloral hydrate. The literature contains a number of such methods which cannot be depended upon to give concordant results on aliquots of the same sample.

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(2) W. Autenrieth, "Detection of Poisons" (1928).

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## POTENTIOMETRIC TITRATION OF ALKALOIDS WITH BIMETALLIC ELECTRODES.

BY M. LESLIE HOLT[1] AND LOUIS KAHLENBERG.[2]

The alkaloids are such weak bases that their direct titration by means of acids and indicators is unsatisfactory. Usually the alkaloid is dissolved in a definite volume of standard acid representing an excess, and the latter is then titrated with standard alkali in the presence of a suitable indicator. Potentiometric titrations have been fairly satisfactory. McGill and Faulkner[3] used the hydrogen electrode to estimate alkaloids in crude drugs. Krantz[4] employed the hydrogen electrode for the estimation of alkaloids in solutions containing an excess of HCl. His results have been called into question by Kolthoff because of the possibility of the reduction of the alkaloid by hydrogen in presence of platinized platinum. To avoid such possible reduction Wagner and McGill[5] used the quinhydrone electrode for determining alkaloids. They obtained fairly reproducible results with solutions of strychnine, strychnine sulphate, morphine and morphine sulphate. Kolthoff[6] used the antimony electrode for potentiometric titration of some of the alkaloids, but with only fair success. Popoff and McHenry[7] employed a bright platinum wire (against a calomel half cell) for the titration of strychnine, quinine, cinchonidine and cocaine.

In a previous paper[8] it has been shown that certain metallic couples serve very well for the potentiometric titration of various acids and bases. Their application to the titration of amines with HCl led to the present investigation, namely, the use of couples for the titration of alkaloids.

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[3] JOUR. A. PH. A., 11 (1922), 1003.
[4] *Ibid.*, 14 (1925), 294.
[5] *Ibid.*, 14 (1925), 288.
[6] *Rec. trav. chim. Pays-Bas*, 44 (1925), 113.
[7] JOUR. A. PH. A., 14 (1925), 473.
[8] M. Leslie Holt and L. Kahlenberg, *Trans. Am. Electrochem. Soc.*, 57 (1930), 113.

A calculated amount of the alkaloid to be titrated (considered as a mono-acid base) was weighed out and dissolved in a known amount of 0.1 *N* HCl, the latter being in excess of that required to form the hydrochloride. Aliquot parts of this solution were taken and the excess of HCl titrated with 0.1 *N* NaOH using the metal couple to indicate the end-point which was also checked with methyl-red indicator. The end-point thus found potentiometrically and colorimetrically was, of course, the point of neutralization of the excess acid before the alkaloid-hydrochloride was decomposed by an excess of NaOH. The remainder of the standard acid was the amount required to neturalize the alkaloid base present in the solution.

The method and apparatus used in the titration was the same as that previously described,[8] and was essentially as follows: The apparatus consisted of a Leeds and Northrup student type potentiometer, a desk galvanometer (sensitivity

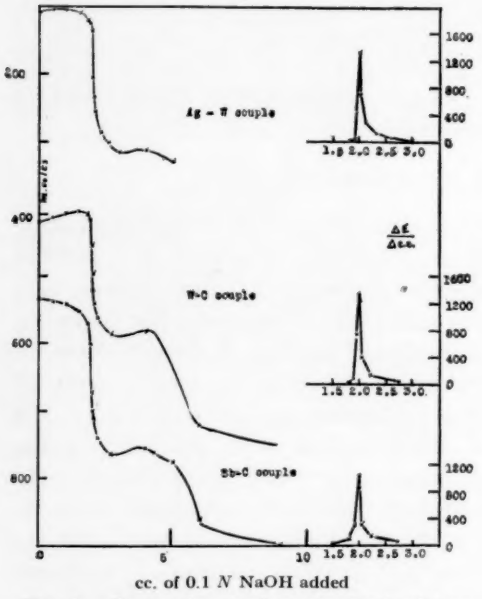


Fig. 1.—Comparing various couples in the potentiometric titration of strychnine (dissolved in excess HCl) with 0.1 *N* NaOH.

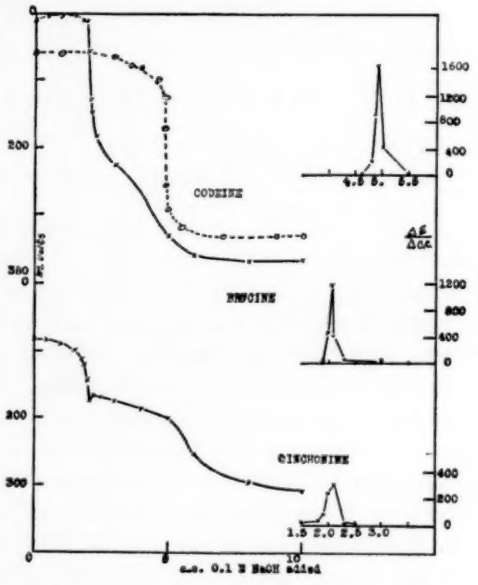


Fig. 2.—Ag-W couple used in the potentiometric titration of various alkaloids (dissolved in excess HCl) with 0.1 *N* NaOH.

2.7 mg.), a motor stirrer, a standard cell, resistance box and tap key. The set-up was the same as that used for the ordinary hydrogen electrode, except that the calomel half cell and platinum black electrode were replaced by the two metal electrodes. The latter were clamped to a bakelite support 1 to 2 cm. apart and connected to the potentiometer through a reversing switch. The electrodes were carefully cleaned, sanded and wiped with clean filter paper each time they were used. The solution to be titrated was introduced into the titration vessel, a 150-cc. beaker, and diluted with water to a volume sufficient to emerse the electrodes 2 to 3 cm. deep. After waiting a few minutes for the couple to attain a reasonably steady difference of potential, the standard solution was introduced from a burette and the change of potential noted on the potentiometer. The solution was stirred continuously with the motor stirrer during the process.

Previous work has shown that the Ag-W, Sb-C and W-C (natural graphite carbon) are the most satisfactory pairs for an acid-base titration. These couples were used separately for the potentiometric titration of a solution of strychnine made by dissolving 1.6715 Gm. of the free base (Merck) in 75 cc. of 0.1 *N* HCl and 50 cc. water; 10 cc. parts of this solution were diluted with 25 cc. water and titrated with 0.1 *N* NaOH. When the electrode pair was put into the solution, the stirrer was started and after waiting about 5 minutes for a fair equilibrium, the alkali was added at definite intervals. The total titration time was twenty to twenty-five minutes, depending on the number of readings taken. The three pairs gave very good results (Fig. 1), the potentiometric end-point checking exactly with the methyl red end-point. The results are presented graphically as the ordinary titration curve (e. m. f. as ordinates against cc. standard alkali added as abscissas) and also with the rate of change of potential $\left(\frac{\Delta E}{\Delta cc.}\right)$ plotted against the volume of added alkali. The data are presented in Table I. The Ag-W couple was selected

TABLE I.—DATA FOR FIG. 1, TITRATION OF STRYCHNINE WITH Ag-W, W-C AND Sb-C COUPLES.

| Ag-W Couple. | | | | W-C Couple. | | | | Sb-C Couple. | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.1 *N* NaOH cc. | E. m. f. mv. | $\Delta E$ | $\frac{\Delta E}{\Delta cc.}$ | 0.1 *N* NaOH cc. | E. m. f. mv. | $\Delta E$ | $\frac{\Delta E}{\Delta cc.}$ | 0.1 *N* NaOH cc. | E. m. f. mv. | $\Delta E$ | $\frac{\Delta E}{\Delta cc.}$ |
| 0.0 | 108 | | | 0.0 | 420 | | | 0.0 | 534 | | |
| 0.5 | 104 | | | 0.5 | 412 | | | 0.5 | 538 | | |
| 1.0 | 105 | | | 1.0 | 407 | | | 1.0 | 542 | | |
| 1.5 | 108 | | | 1.5 | 402 | | | 1.5 | 552 | 10 | 20 |
| 1.8 | 120 | 12 | 40 | 1.8 | 407 | 5 | 16 | 1.8 | 570 | 28 | 93 |
| 1.9 | 125 | 5 | 50 | 1.9 | 417 | 10 | 100 | 1.9 | 600 | 30 | 300 |
| 1.93 | 138 | 13 | 433 | 1.95 | 455 | 38 | 760 | 1.97 | 672 | 72 | 1029 |
| 1.98 | 205 | 67 | 1340 | 1.98 | 495 | 40 | 1330 | 2.0 | 698 | 26 | 866 |
| 2.02 | 234 | 29 | 725 | 2.0 | 520 | 25 | 1250 | 2.04 | 710 | 12 | 300 |
| 2.08 | 252 | 18 | 300 | 2.05 | 540 | 20 | 400 | 2.2 | 739 | 29 | 170 |
| 2.3 | 284 | 32 | 145 | 2.2 | 560 | 20 | 135 | 2.7 | 764 | 25 | 50 |
| 2.6 | 300 | 16 | 53 | 2.7 | 585 | 25 | 50 | 4.0 | 755 | | |
| 3.0 | 314 | 14 | 35 | 4.0 | 580 | | | 4.3 | 762 | | |
| 4.0 | 310 | | | 6.0 | 720 | | | 5.0 | 775 | | |
| 5.0 | 328 | | | 9.0 | 750 | | | 6.0 | 860 | | |
| | | | | 11.0 | 750 | | | 9.0 | 940 | | |
| | | | | | | | | 11.0 | 950 | | |

for titration of other alkaloids because the potentials are more nearly reproducible and the couple is very convenient to use. The tungsten electrode used was 2 cm. wide, 8 cm. long and 1 mm. thick. The silver electrode was 1 cm. by 5 cm. It was cut from a sheet of pure silver. The size of the electrode apparently has very little effect on the titration, for a small tungsten rod and a silver wire were just as satisfactory as the larger electrodes. The same procedure was followed in all the following titrations using 10-cc. portions of the solutions as made up and diluting with 25 cc. water.

The codeine solution was made by dissolving 0.7982 Gm. of the free base (Mallinckrodt, U. S. P.) in 75 cc. 0.1 *N* HCl and 50 cc. water. As shown in Fig. 2 the results of the titration were very satisfactory. The end-point was easily found. The potentiometric and colorimetric (methyl-red) end-points checked very closely.

The brucine solution was made by dissolving 1.1611 Gm. of the free base

(Merck) in 50 cc. 0.1 *N* HCl and 50 cc. water. The results of the titration of 10 cc. of this solution are shown in Fig. 2. The end-point was entirely satisfactory. There was a secondary potential change on addition of excess of alkali, giving evidence of the decomposition of the brucine hydrochloride.

The titration of cinchonine was not very successful, 1.4713 Gm. of the free base (Lehn and Fink) were dissolved in 75 cc. 0.1 *N* HCl and 50 cc. water. The methyl-red end-point was very vague but the potentiometric end-point was fairly definite as shown in Fig. 2. Here also there was a secondary potential change indicating the breaking down of the hydrochloride.

The morphine solution contained 0.7852 Gm. of the free base (Merck U. S. P.) with 75 cc. of 0.1 *N* HCl and made up to a volume of 125 cc. with water. In this titration the indicated potentiometric end-point was very sharp and definite and the salt decomposition hardly noticeable—Fig. 3.

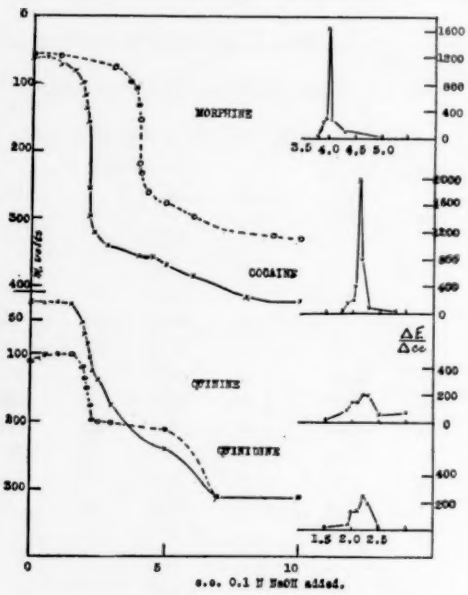


Fig. 3.—Ag-W couple used in the potentiometric titration of various alkaloids (dissolved in excess HCl) with 0.1 *N* NaOH.

The cocaine solution was made by dissolving 1.5163 Gm. of the free base (Mallinckrodt U. S. P.) in 75 cc. 0.1 *N* HCl and 50 cc. water. The potentiometric end-point was very good—Fig. 3. There was a secondary potential change for the decomposition of the hydrochloride.

The titrations of quinine and quinidine were perhaps the least successful of those attempted. The solutions were made by dissolving 1.6216 Gm. of the free base (Quinine, Merck U. S. P.; Quinidine, Merck N. F. V) in 75 cc. 0.1 *N* HCl and diluting each to a volume of 125 cc. Methyl-red gave no indication of the end-point and the potentiometric end-points (Fig. 3) were very poor. The hydrochloride formed is decomposed so easily that the titration of the free base in excess of HCl is hardly feasible.

Table II shows the results of these alkaloid titrations. The point of maximum change of potential per volume of added alkali $\left(\frac{\Delta E}{\Delta cc.}\right)$ was taken as the end-point. These were sharp and definite except in the cases of quinine and quinidine. The potentials were steady and quick to reach a reasonable equilibrium after each addition of reagent. The change at the end-point was definite and rapid. All results were checked and found entirely reproducible, particularly for the observed end-points. However, the initial and final potentials were not always repeatable because these potentials are affected by the conditions of the titration. This is in general true of all titrations with bi-metallic electrodes.

The effect of quinhydrone on Ag-W and Sb-C couples in the titration of strych-

TABLE II.—RESULTS OF INDIRECT POTENTIOMETRIC TITRATIONS OF VARIOUS ALKALOIDS WITH THE Ag-W COUPLE.

| Alkaloid. | 0.1 *N* NaOH to Neutralize Excess HCl. | | Grams of Alkaloid. | |
|---|---|---|---|---|
| | Calc. NaOH cc. | Required NaOH cc. | Present. | Found. |
| Brucine | 2.05 cc. | 2.06 cc. | 0.1161 Gm. | 0.1157 Gm. |
| Cinchonine | 2.0 cc. | 2.1 cc. | 0.1177 Gm. | 0.1148 Gm. |
| Codeine | 5.0 cc. | 4.91 cc. | 0.0639 Gm. | 0.0696 Gm. |
| Cocaine | 2.0 cc. | 2.1 cc. | 0.1213 Gm. | 0.1183 Gm. |
| Morphine | 4.0 cc. | 4.0 cc. | 0.0628 Gm. | 0.0628 Gm. |
| Quinidine | 2.0 cc. | 2.2 cc. | 0.1297 Gm. | 0.1232 Gm. |
| Quinine | 2.0 cc. | 2.2 cc. | 0.1297 Gm. | 0.1232 Gm. |
| Strychnine | 2.0 cc. | 1.97 cc. | 0.1337 Gm. | 0.1347 Gm. |

nine was studied. A small amount of quinhydrone was added to the solution in the titrating vessel and the titration was carried out in the usual manner. The quinhydrone altered the difference of potential between the electrodes, but did not aid in the determination of the end-point, for it neither increased the magnitude nor the sharpness of the potential change. In fact the indication of the end-point was rather less satisfactory, so this effect was not studied further.

SUMMARY.

1. The bi-metallic electrodes Sb-C, W-C and Ag-W have been used in the indirect electrometric titration of strychnine.

2. The Ag-W pair was used in the titration of brucine, cinchonine, codeine, cocaine and morphine.

3. The titration of quinine and quinidine with the Ag-W couple was not satisfactory.

4. Quinhydrone does not enhance the value of the Ag-W and Sb-C couples in the titration of strychnine.

CHEMICAL LABORATORY,
UNIVERSITY OF WISCONSIN, MADISON,
November 1930.

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## THE SPECIFIC GRAVITY OF MIXTURES OF CHLOROFORM (U. S. P.) AND BENZYL ALCOHOL.*

BY SAMUEL M. GORDON.

An examination of several proprietary remedies, exploited extensively to the dental profession as local anesthetics, revealed that they consisted of mixtures of benzyl alcohol and chloroform.

Benzyl alcohol has found limited use as a local anesthetic by injection or by infiltration in minor surgical operation, including the extraction of teeth. In ordinary doses it is stated to be practically non-irritant and non-toxic. In addition, pure benzyl alcohol is reported to possess antiseptic properties.[1]

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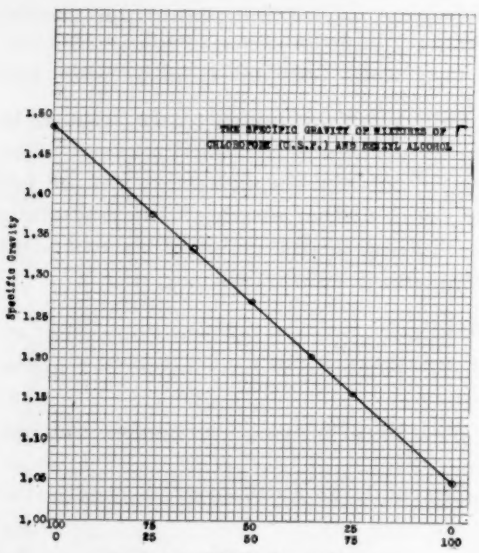
* Contribution from the American Dental Association Bureau of Chemistry and the American Medical Association Chemical Laboratory.

[1] A more complete description of benzyl alcohol may be found in "New and Nonofficial Remedies," 1930, published by the American Medical Association.

As an anodyne by topical application, for the relief of "toothache," its use in mixture with equal parts by volume of chloroform has been suggested.[1]

The ready availability of the drug taken in conjunction with its possible uses in minor dental operations led to the marketing of the product in mixture with chloroform under secret, proprietary names, non-informative of the nature of the product.

Having definitely recognized the presence in a mixture of benzyl alcohol and chloroform, to the exclusion of other compounds, an accurate and readily available method for the determination of the proportions of each is desirable. On account of the inherent difficulties of the exact determination of the constituents by chemical means, the application of simple, physical methods suggested themselves.




Per cent $CHCl_3$ by volume.
Per cent $C_6H_5CH_2OH$ by volume.

Fig. 1.

It is well known that if the densities of pure liquids are plotted on cross-section paper and a line drawn connecting the points, the densities of mixtures of these two liquids will fall on a straight line. Thus, the specific gravity of several pure liquids and mixtures thereof are determined. The specific gravity of benzyl alcohol and chloroform and mixtures thereof were determined, and the graph prepared, as already explained.

By determining the specific gravity of the unknown, the percentage composition in terms of the two components can be readily estimated from the graph with a desirable degree of accuracy.

## EXPERIMENTAL.

Benzyl alcohol—"highest purity Merck" and redistilled chloroform (U. S. P. X)[2] were used.

The volumes of each product were measured from a burette at a temperature of 23.5–24° C.

| Per Cent by Volume. | | Specific Gravity. |
|---|---|---|
| Benzyl alcohol. | Chloroform. | |
| 100 | 0 | 1.0468 |
| 75 | 25 | 1.1591 |
| 65 | 35 | 1.2034 |
| 50 | 50 | 1.2692 |
| 35 | 65 | 1.3345 |
| 25 | 75 | 1.3780 |
| 0 | 100 | 1.4843 |

[1] D. I. Macht, *Jour. A. M. A.*, 75 (1920), 1205.

[2] Chloroform U. S. P. X "contains not less than 99.0 per cent and not more than 99.5 per cent of $CHCl_3$, the remainder consisting of alcohol."

The specific gravities of the mixtures were determined at 20° C. ± 0.5 in a pycnometer of the Geissler type.[1]

The results are plotted on the foregoing graph, and yield as expected a straight line when the points are connected. Hence, by determining the specific gravity of a mixture containing chloroform and benzyl alcohol, and referring to the graph, the composition may be readily determined with a reasonable degree of accuracy.

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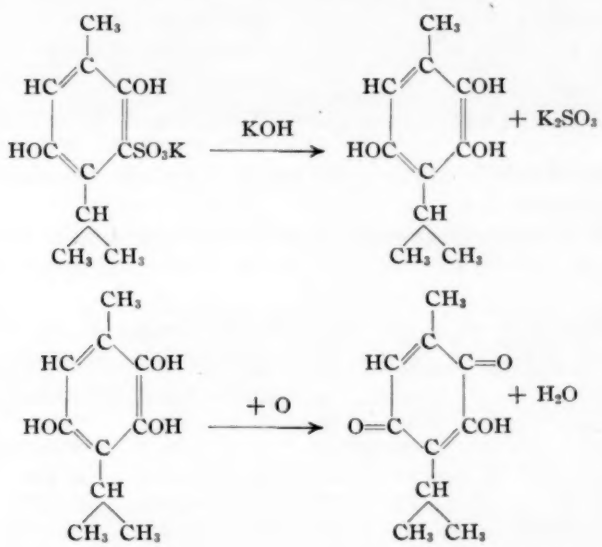
## RATE OF OXYGEN ABSORPTION BY CARSTANJEN'S COMPOUND UPON THE ADDITION OF AN ALKALI.*

BY A. A. HARWOOD.

It was observed by Carstanjen[1] that upon addition of an alkali to a solution of 1-methyl-4-isopropyl-2,5-hydroxy-3 or 6-potassium sulphone benzene, it assumed a dark red color. He believed this to be due to the absorption of oxygen from the air. The reaction possibly takes place in the following manner:




According to the above reactions one molecule of Carstanjen's compound in aqueous solution should absorb one-half molecule of oxygen.

*Experimental Procedure.*—An apparatus was constructed in which it was possible to introduce, without admitting air, first Carstanjen's compound in aqueous solution into a reaction chamber, then an equimolecular amount of KOH also in aqueous solution. The accompanying sketch of the apparatus will illustrate the manner of manipulation.

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[1] See for example: "Food Analysis" by A. G. Woodman or any other standard work on analytical methods.

* Presented to the Scientific Section. Part of a thesis presented as one of the requirements for the doctor's degree, University of Wisconsin.

[1] *J. prakt. Chem.*, 123 (1877), 478.

Two grams of the Carstenjen's compound in 25 cc. of water were introduced into tube B through stop-cock H by lowering bulb A and opening the stop-cock H so as to let the solution run in without admitting any air, the mercury level initially being up to H. The aqueous KOH solution was then introduced as before allowing a few drops to remain in tube F. Oxygen was then allowed to flow through tube G into the gas burette D displacing the water in the burette down to about the 100-cc. mark. The volume of the oxygen was then determined at atmospheric pressure by use of the leveling tube E. After this the stop-cocks I and H were placed in the correct position to allow the oxygen to pass from D to B. After remaining in B for approximately five minutes, the oxygen was forced back over into D by raising bulb A until the top of the combined solution came up to H. The remaining oxygen in burette D was then measured as before. This procedure was repeated until no further diminution of volume was noted. The results are herewith recorded:

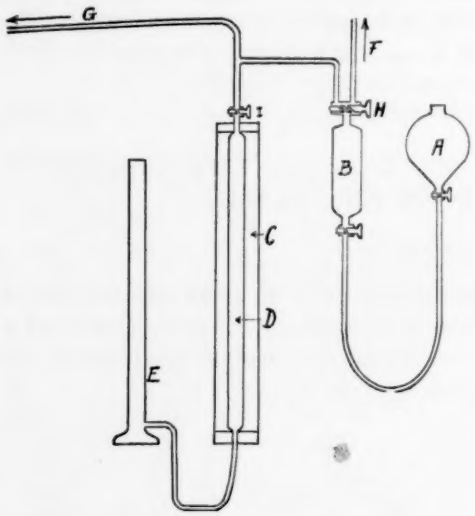

Fig. 1.

*Experiment I.*—(The absorption chamber was not shaken during the experiment.)

| Amount of Carstanjen's compound in 25 cc. of water. | KOH in 15 cc. water. | Time. | Min. | Reading of $O_2$ vol., cc. | $O_2$ used, cc. | | $O_2$ (std. cond.) absorbed per gram mole. Liters. |
|---|---|---|---|---|---|---|---|
| 2.00 Gm. | 0.5 Gm. | 4:50 | 0 | 99.5 | 0 | | Bar. P. 734.0 |
| | | 4:55 | 5 | 59.8 | 39.7 | 4.9625 | Temp. 27.0° C. |
| | | 5:00 | 10 | 37.2 | 62.3 | 7.7875 | |
| | | 5:05 | 15 | 29.0 | 70.5 | 8.8125 | |
| | | 5:10 | 20 | 22.8 | 76.7 | 9.5875 | |
| | | 5:15 | 25 | 20.0 | 79.5 | 9.9375 | |
| | | 5:22 | 32 | 17.0 | 82.5 | 10.2325 | |
| | | 5:30 | 40 | 15.2 | 84.3 | 10.5375 | |
| | | 5:35 | 45 | 14.6 | 84.9 | 10.6125 | |
| | | 5:42 | 52 | 13.8 | 85.7 | 10.7125 | |
| | | 5:50 | 60 | 12.7 | 86.8 | 10.8500 | |
| | | 6:00 | 70 | 10.9 | 88.6 | 10.9250 | |
| | | 6:05 | 75 | 10.0 | 89.5 | 11.0750 | |
| | | 6:08 | 78 | 9.4 | 90.1 | 11.1875 | |
| | | 6:12 | 82 | 8.8 | 90.7 | 11.2625 | |
| | | 7:00 | 130 | 5.0 | 94.5 | 11.3375 | |
| | | 7:15 | 145 | 4.2 | 95.3 | 11.8125 | |
| | | 7:30 | 160 | 4.2 | 95.3 | 11.8125 | |

95.3 cc. reduced to standard conditions of temperature and pressure = 88.8 cc. or 0.1197 Gm.

*Experiment II.*—(The absorption chamber was shaken by hand during the experiment.)

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 2.00 Gm. | 0.5 Gm. | 8:45 | 0 | 100.3 | 0 | | |
| | | 8:50 | 5 | 55.5 | 44.8 | 5.6500 | Bar. P. 738.2 |
| | | 8:57 | 12 | 43.7 | 56.6 | 7.1310 | Temp. 25.5° C. |
| | | 9:05 | 20 | 35.7 | 64.6 | 8.1396 | |
| | | 9:13 | 28 | 25.0 | 75.3 | 9.4878 | |
| | | 9:16 | 31 | 21.5 | 78.8 | 9.9288 | |
| | | 9:23 | 38 | 17.7 | 82.6 | 10.4076 | |
| | | 9:35 | 50 | 17.7 | 82.6 | 10.4076 | |

82.6 cc. reduced to standard conditions of temperature and pressure = 73.4 cc. or 0.1049 Gm.

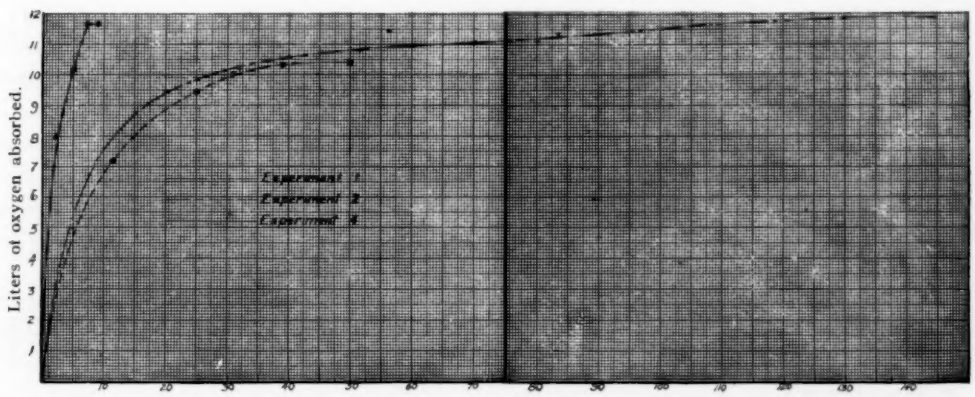


Fig. 2.

*Experiment III.*—A third experiment was made without determining the rate. It resulted in an absorption of 84.1 cc. of $O_2$ which is equivalent to 0.1199 Gm. of $O_2$.

*Experiment IV.*—A fourth determination was made in the same manner as those above with the exception that bulb B was placed on a mechanical shaker which moved back and forth 200 times a minute.

| Amount of Carstanjen's compound of 25 cc. of water. | KOH in 15 cc. water. | Time. | Min. | Reading of $O_2$ vol., cc. | $O_2$ used, cc. | $O_2$ (std. cond.) absorbed per Gm. mole. Liters. | |
|---|---|---|---|---|---|---|---|
| 2.00 Gm. | 0.5 Gm. | 2:42 | 0 | 97.0 | 0 | | |
| | | 2:44 | 2 | 30.2 | 66.8 | 8.023 | Bar. P. 726.8 |
| | | 2:47 | 5 | 7.4 | 89.6 | 10.764 | Temp. 29.0° C. |
| | | 2:49 | 7 | 2.1 | 94.9 | 11.658 | |
| | | 2:51 | 9 | 2.1 | 94.9 | 11.658 | |

The fourth experiment reveals the striking rapidity with which the oxygen is absorbed under favorable conditions. 94.9 cc. reduced to standard conditions of temperature and pressure = 82.1 cc. of $O_2$ or 0.1163 Gm.

According to the equations given above, one-half molecule of oxygen should be absorbed by one molecule of Carstanjen's compound. Therefore, 284 Gm. should absorb 11,190 cc. of $O_2$ ($^1/_2$ of 22.380 cc.) and 2 Gm. should absorb 78.8 cc. (0.1126 Gm.).

From the above results it would appear that the equations given are a true picture of the reaction.

The following graphs are plotted with the liters of oxygen absorbed by a gram-molecular amount of Carstanjen's compound, treated with a gram-molecular amount of potassium hydroxide, against the time, in minutes, required to absorb the oxygen.

*Experiment V.*—To avoid the obvious errors in time exposed, the oxygen was transferred to the reaction chamber and allowed to remain during the entire course of the experiment. The reaction chamber was placed in a shaking machine and shaken during the time the solutions were exposed to the action of the oxygen. In this manner the following results were obtained:

| Wt. of Carstanjen's compound. | Wt. of KOH. | Cc. of $O_2$ abs. | Wt. of $O_2$ abs. | Time. |
|---|---|---|---|---|
| 2.0 Gm. | 0.5 Gm. | 82.1 | 0.1163 Gm. | 7 min. |
| 1.0 Gm. | 0.25 Gm. | 44.0 | 0.0620 Gm. | 2 min. |
| 0.5 Gm. | 0.14 Gm. | 28.0 | 0.0395 Gm. | 1 min. 35 sec. |
| 0.25 Gm. | 0.085 Gm. | 14.8 | 0.0209 Gm. | 1 min. 30 sec. |
| 0.10 Gm. | 0.045 Gm. | 5.2 | 0.0073 Gm. | 1 min. 5 sec. |

These reactions are of special interest to the student of the biochemistry of the Monardas and other plants containing thymoquinone and its hydroxy derivatives.

FROM THE LABORATORY OF EDWARD KREMERS.

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## CHEMICAL CONSTITUTION AND ANTHELMINTIC ACTION.*

BY ANTOINE E. GREENE.

Having studied a large number of the commonly employed anthelmintics, the writer attempts to group them into definite classes, according to similarity in chemical structure and analogous pharmacological action.

Six groups are drawn off. There are the following groups which might conveniently fall into an orderly classification according to the modern system: 1, Paracymene or Thymol Group; 2, Phlorglucinol-Butyric Acid Group; 3, Lactone Group; 4, Alkaloid Group; 5, Halogen Group; 6, Heterogeneous Group.

The writer submits this chemical classification to provoke the study of these drugs and medicaments in the light of chemical structure and relationship and corresponding medicinal action. The question is raised whether synthetical organic chemistry may some day furnish medicine an "Anthelmintic Molecule" which will possess all of the desirable and none of the undersirable and dangerous properties of those drugs which are employed to-day in helminthic therapy.

The present trend in synthetic organic chemistry and pharmacology is to interpret and predict the physiological action of drugs and synthetics on the basis of chemical structure. It has been found that the position of substituents in aliphatic chains and aromatic nuclei may profoundly affect the color, odor, taste and toxicity of the molecule. The introduction of alkyl, hydroxyl, carboxyl and amino groups may modify the solubility, stability and pharmacology of many drugs of the cyclic series. Stereoisomerism plays a part in the pharmacodynamics of medicinals, for optical isomers may evidence great differences in characteristic physiological reactions when tested on animal or vegetable organisms. It is only necessary to consider phenol and salicylic acid, aniline and acetanilide and phenol, resorcinol and hexyl-resorcinol to note how the presence of substituents may alter

* Scientific Section, A. PH. A., Baltimore meeting, 1930.

the physical, chemical and pharmacologic properties of organic drugs. It is well known that the official lævogyrate epinephrine is fifteen times more powerful as a vasoconstrictor than the dextrorotatory isomer. Accumulated evidence from the study of chemical structure and medicinal action has formulated the hypothesis that like chemical structure indicates, in a large number of cases, analogous pharmacological action, and the natural and synthetic drugs may be classified into groups which show a similarity in molecular configuration and physiological activity. A study of the structures of cocaine, procaine, benzocaine, stovaine and other local anesthetics will show striking relationship between the chemical constitution and specific pharmacological action. Since it is well established that on a basis of the possession of like structure, there is a classification of drugs into antiseptics, local anesthetics, hypnotics and antipyretics, the writer, who is at present engaged in the study of the bio-evaluation of anthelmintics, sought to investigate the chemical structures of drugs commonly used in helminthic therapy, and determine if it was possible to classify these medicaments of proven therapeutic value according to the modern idea of chemical constitution and specific physiological action.

Excluding chloroform, carbon tetrachloride, tetrachlorethylene and those vegetable drugs, the constituents of which do not fall into any definite class, the following anthelmintics offer possibilities for the modern classification: Thymol, carvacrol, menthol, cineol, ascaridol, oil of turpentine, camphor, aspidium constituents and derivatives of phlorglucinol, santonin, coumarin and synthetic lactones, naphthalene, betanapthol, and the alkaloids of *Areca Catechu* and *Punica Granatum*. In the study of these groups the writer arranges them in the following manner:

Thymol Group (Thymol, menthol, ascaridol, etc.)
Phlorglucinol Group (Aspidium constituents, etc.)
Lactone Group (Santonin, etc.)
Alkaloids (Arecoline, pelletierine, etc.)
Heterogeneous Group (Naphthalene, betanaphthol, methyl salicylate, turpentine, halogen compounds would form a fifth group of unrelated anthelmintics)

All of the above named drugs have been employed in the treatment of human and animal helminthiasis. Some are specific in their action. Santonin shows a selective toxicity against *Ascaris lumbricoides* and *Tricocephalus dispar;* chenopodium, thymol and betanapthol manifest marked uncinaricidal properties; the phlorglucinol derivatives of *Aspidium* and *Brayera* possess considerable toxicity for tænia.

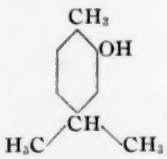
These drugs are sparingly soluble in the body fluids, but, even in small doses, the exhibition of oleaginous fluids and by prolonged contact with the intestinal juices, cause disagreeable symptoms and often intoxication. The ideal anthelmintic therefore, should possess the following properties:

1. Insolubility in the gastro-intestinal fluids.
2. Maximum parasitropic power.
3. Absence of taste.
4. Low toxicity for patient.
5. Availability (from natural or synthetic products).
6. Rapid elimination.
7. General specificity for intestinal parasites.

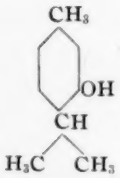
None of the much used drugs known as anthelmintics can satisfy the requirements, but it is hoped that chemical synthesis may some day produce a compound which, fulfilling the desired requisites, might be called the "Anthelmintic Molecule." Infestation by intestinal protozoa and metazoa is still a problem which confronts the physician, whether he practices in the temperate zone or in the tropics.

The following formulas may show the close structural relationship of the members of the Thymol Group.

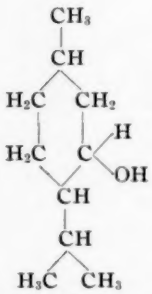
*p*-Cymene



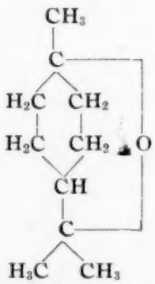
Carvacrol



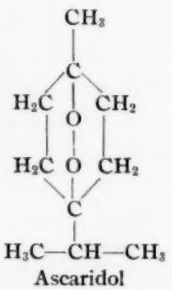
Thymol



Menthol



Eucalyptol or Cineol

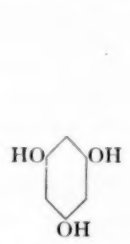


Ascaridol

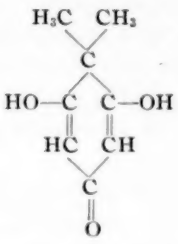
A cursory examination of these molecular constitutions will show that whether, cyclic or isocyclic, there exists three important groups. These are the Methyl, Hydroxyl and Isopropyl Groups. The ascaridol molecule with its internal oxygen bridge might well be compared with menthol and eucalyptol. Ascaridol, one of the chief constituents of oil of chenopodium, is a proven anthelmintic, while eucalyptol and menthol possess feeble anthelmintic properties when tested against the ascarides. Using Schneider's modification of the Trendelenburg method, the writer compared paracymene, thymol and carvacrol. All of these drugs possessed lumbricidal properties, but thymol killed the test animals most rapidly. Menthol may be considered a hydrogenated thymol, but it is interesting to compare the source, physical and chemical characteristics, and medicinal action of the two compounds. Thymol is a powerful agent in the treatment of infestation by the hookworm, *Ankylostoma duodenale* or *Necator Americanus*, while menthol is an indifferent vermifuge against *Oxyuris vermicularis*, the thread worm.

For a long time male fern and its ethereal extract have been used in the treatment of tape worm infestation, and this remedy enjoys considerable use to-day in the treatment of this form of helminthiasis. The official oleoresin possesses the virtues of the crude drug in a concentrated form and is the preparation most

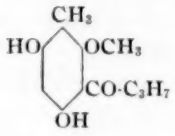
frequently exhibited. This extract contains at least four interesting compounds. Analysis indicates that these substances are derivatives of phlorglucinol. On acid or alkaline hydrolysis of aspidium extracts, phlorglucinol and butyric acid are found among the products of decomposition. The following formulas will show the structural relationship of phlorglucinol and aspidium constituents.



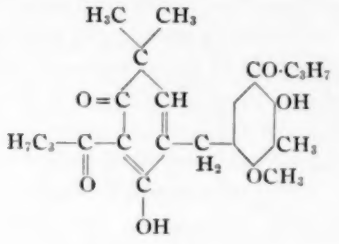
Phlorglucinol



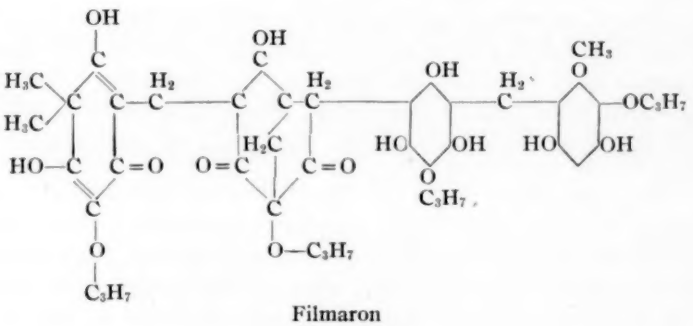
Filicic Acid



Aspidinol

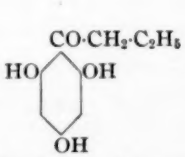


Aspidin

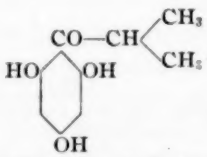


Filmaron

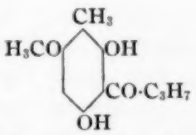
From an examination of these structures it appears that aspidinol and filicic acid may be cleavage products from aspidin. The formula of filmaron with its carbon bridge points to chemical instability, and some of the constituents of the ethereal extract may be the products from the decomposition or breaking up of this molecule due to drastic methods of extraction. Karrer and Widmer succeeded in synthesizing a number of compounds, which according to them, possess anthemintic properties comparable to the preparations of aspidium. The formulas of these synthetics may be compared with the structures of the above aspidium constituents.



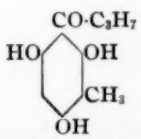
(1) Phlorobutyrophenone



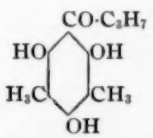
(2) Phloroisobutyrophenone



(3) Isoaspidinol



(4) Methylphlorobutyrophenone



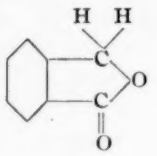
(5) Dimethylphlorobutyrophenone

By the action of butyric acid nitrile and hydrochloric acid on methylphlorglucinol-beta monomethyl ether, these workers prepared aspidinol, a constituent of oleoresin of aspidium, considered by some authorities to be devoid of anthelmintic activity. While iso-aspidinol possesses vermicidal properties, aspidinol, an isomer, is inactive. This is an interesting example of how the position of substituents and radicals in a compound may condition pharmacological action.

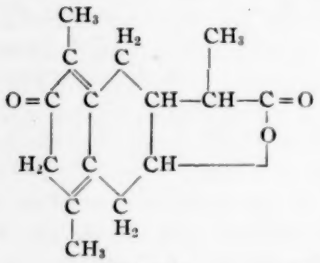
Turning now to the santonin or lactone group, we may consider the molecular structure of the compound and its derivatives. One of the drawbacks to the use of this drug is its toxicity for the patient. While specific against the ascaris, the literature bears abundant evidence of many cases of intoxication caused by the use of the drug in helminthic treatment.

Von Oettingen attempted to reduce the toxicity of santonin by saturating the double linkages in the compound. These tetra-hydrosantonins proved to be less toxic and more efficient than santonin, testifying to the influence of modification of structure and detoxification.

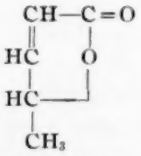
Lautenschlager, investigating the specific anthelmintic power of the lactone group, prepared a number of aromatic lactones which possess anthelmintic action. A single example may bear out the result of his researches. He found that a phthalid, prepared from phthalic anhydride, exhibited ascaricidal properties comparable with santonin. The formula for this synthetic anthelmintic is



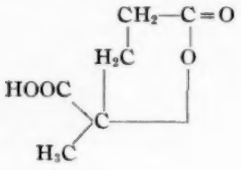
Some investigators contest the value of the lactone structure in conferring specific action upon this class of drugs. Caius and Mharask aver that the ketone structure confers definite helminthicidal action upon the compound. Oshika



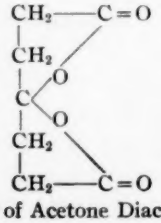
Santonin



Beta Angelica Lactone



Valero Lactone Carboxylic Acid



Dilactone of Acetone Diacetic Acid

claims that the conversion of the lactone into free carboxyl caused a loss of activity, but the esterification of the acid would restore the vermicidal power. It is interesting to observe that, while salicylic acid is not a good vermifuge, the methyl ester manifests considerable toxicity for the ascaris.

Von Oettingen prepared lactones from the aliphatic series and tested these synthetics for anthelmintic power. The foregoing formulas are submitted for a comparison between chemical constitution and pharmacological action.

On comparing the toxicity of these compounds with santonin, using the Lumbricus terrestris as a test animal, Von Oettingen obtained the following results:

| Lactone. | Time, hours. | Per cent killed. | Time hours. | Per cent killed. |
|---|---|---|---|---|
| Concentration | 0.04 molar | | 0.004 molar | |
| Beta-angelica-lactone | 2–3 | 100 | 24 | 20 |
| Valerolactone-COOH | 4 | 100 | 24 | 0 |
| Dilactone | 3 | 100 | 24 | 0 |
| Santonin | 3 | 100 | 24 | 100 |

The above evidence points to the specificity of the Lactone Group in anthelmintic activity.

Chloroform, tetrachlorethylene, carbon tetrachloride and paradichlorbenzol are representatives of the Halogen Group of vermifuges. Carbon tetrachloride has earned sufficient reputation to justify its employment in the treatment of uncinariasis. Chloroform has been used to expel ascarides.

Petroleum ether, petroleum, kerosene, napthalene and alpha pinene from turpentine have been exhibited in various forms in the treatment of intestinal infestation, but these agents are not very powerful anthelmintics. Betanaphthol has been used, but its taste and toxicity bar its exhibition as a valuable remedy. According to Caius and Mhaskar, esterification of betanapthol converts it into an inactive compound. Alphanaphthol is too poisonous for use in internal medication, although *in vitro*, it is actively lumbricidal.

The alkaloids of *Pomegranate* show interesting similarities to coniine, the chief alkaloid of *Conium maculatum*, or hemlock. Arecoline, the anthelmintic alkaloid of *Areca catechu*, or the betel nut, is sometimes used to kill and expel intestinal parasites. The other constituents of Areca, namely arecaine and guvacine need investigation to discover their anthelmintic possibilities.

The subject of anthelmintics needs a serious and extended investigation. Synthesis may furnish an anthelmintic molecule, endowed with all of the advantages of an ideal remedy and free from the dangers and disadvantages. More study should be placed upon the natural products and their characterization. The writer is investigating the employment of microscopic plants and animals as test objects in the bio-evaluation of that important class of remedial agents known as anthelmintics.

In the opinion of the writer, it is possible to classify anthelmintics according to chemical constitution, and chemical pharmacology may well make use of this modern classification of medicinal agents.

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J. F. Caius and K. J. Mhaskar, *Indian J. Med. Research*, 11 (1923–1924), 371.
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## FAILURE OF A DIABETIC TO UTILIZE INULIN.

BY E. C. WISE AND F. W. HEYL.

In a previous paper (1) the failure of a diabetic to utilize the carbohydrate in dried artichoke powder was discussed. The sugar tolerance of the subject was carefully determined on a weighed analyzed diet both before and after supplemental feedings of dried artichoke powder. These data were obtained during an experimental period covering thirty days. While the subject was available and his diet in balance with his apparent sugar tolerance, an additional short experimental period was instituted during which time a supplemental feeding of inulin prepared from artichokes was made. These data were not published at that time but in view of the considerable interest in the results of the feeding of dried artichokes it was thought that the results of the inulin feeding would also prove of interest.

A number of papers have appeared in the literature in the past which indicate that levulose, as well as some of its condensation complexes such as inulin, may serve as a source of a more utilizable carbohydrate in diabetes. A number of references are reviewed by Shohl (2).

Jerusalem artichokes contain approximately 80 per cent moisture and 15 per cent of carbohydrates. The carbohydrates consist largely of inulin and other condensation products of levulose which make up about 85 per cent of the total carbohydrate. The remaining 15 per cent of the carbohydrate consists of sucrose, levulose and dextrose. The quantities of the various sugars vary rather widely with the season of the year. In the preparation of artichokes for food the proportions of the various sugars may also be altered, that is, a portion of the inulin may be hydrolyzed to levulose.

There is evidence to show that inulin is not absorbed. Lewis (3) doubted the value of inulin feeding. Lewis and Frankel (4), working with phlorhizinized dogs, state that there seems to be little probability that an appreciable amount of inulin is converted into any substance that can give rise to glucose in the diabetic. Root and Baker (5) state that inulin produced no significant increase in the blood sugar in either normal or diabetic subjects. It did, however, have a slight effect upon the respiratory quotient of two patients, but the evidence is difficult to consider favorably.

In the case of the diabetic under our observation it is doubtful if any inulin at all was absorbed. The subject was fed on a level very close to his sugar tolerance and in addition to this ate rather large quantites of inulin. Accepting 12 per cent as the amount of inulin in Jerusalem artichokes, the daily ration of inulin, 30 Gm., represents a feeding of about 250 Gm. of whole artichokes. If any appreciable hydrolysis and absorption of the products of hydrolysis had taken place the subject must necessarily have shown some glycosuria. Such, however, was not the case and we feel convinced that inulin is not utilized. However, no inulin was

found in the feces so that, with Lewis, we explain the disappearance of the inulin as the result of some type of intestinal fermentation.

If this view of the matter is correct, then the alleged increased tolerance of diabetics to Jerusalem artichokes is readily accounted for. Obviously if the preparation of the artichokes for food leaves an unhydrolyzed portion of inulin the apparent tolerance of the patient to artichoke carbohydrate will be greater than the tolerance to any carbohydrate which is completely utilized. Where the conversion of the inulin is complete, as in the dried artichoke powder which was fed as previously described (1), no advantage of this kind would be noted.

## EXPERIMENTAL.

The subject at the beginning of the experiment was receiving a diet yielding 69 Gm. protein, 236 Gm. fat, and 105 Gm. of carbohydrate, the available glucose content of this diet being 169 Gm. Procedure, methods of analysis and other details were carried out as described previously (1). The subject was fed, in addition to the basal diet, 30 Gm. of inulin daily for three days and 22 Gm. on the fourth day, followed by three days on the basal diet only. The inulin used was prepared in the laboratory by precipitating water extracts of fresh artichokes with 95 per cent alcohol and collecting the precipitated inulin. The precipitate was analyzed for inulin by determining its reducing power after hydrolysis. This determination was run in series with C.P. inulin. Our material was approximately 80 per cent inulin and was free from any reducing sugars.

The subject at this time had just concluded a period of supplemental feeding of dried artichoke powder and was now eating the basal diet only. He was still excreting a few grams of glucose daily which was merely a lag from having previously been fed above his tolerance. In spite of the addition of inulin the urinary sugar gradually became negative.

TABLE I.—BASAL FOOD INTAKE.

| Day. | Protein, Gm. | Fat, Gm. | Carbohydrate, Gm. | Available glucose, Gm. | Water, cc. | Weight, pounds. | Inulin added in grams of carbohydrate. |
|---|---|---|---|---|---|---|---|
| 31 | 69.2 | 236 | 105 | 169 | 950 | 119 | 30 |
| 32 | 69.2 | 236 | 105 | 169 | 1350 | 119 | 30 |
| 33 | 69.2 | 236 | 105 | 169 | 1000 | 119 | 30 |
| 34 | 69.2 | 236 | 105 | 169 | 1000 | 118 | 22 |
| 35 | 69.2 | 236 | 105 | 169 | 1150 | 118 | .. |
| 36 | 69.2 | 236 | 105 | 169 | 1150 | 119 | .. |
| 37 | 69.2 | 236 | 105 | 169 | 1200 | 119 | .. |

TABLE II.—URINE ANALYSES.

| Day. | Volume, cc. | Specific gravity. | Acetone. | Nitrogen, Gm. | Sugar, Gm. |
|---|---|---|---|---|---|
| 31 | 1370 | 1.020 | None | 10.4 | 4.3 |
| 32 | 1260 | 1.020 | None | 10.0 | 3.8 |
| 33 | 940 | 1.026 | None | 10.1 | 3.1 |
| 34 | 840 | 1.028 | None | 10.6 | 3.5 |
| 35 | 900 | 1.021 | None | 9.6 | 0.0 |
| 36 | 910 | 1.023 | None | 10.2 | 3.6 |
| 37 | 1030 | 1.020 | None | 9.6 | 0.0 |

From these data it is evident that inulin was not utilized in any appreciable quantity. At the beginning of the inulin feeding the patient was excreting about 4 Gm. of glucose daily and any utilization of inulin would have been reflected in an increased output of urine sugar. Such was not the case and the excretion of glucose became negative on the seventh day in spite of 112 Gm. of inulin fed during the first four days of the period. The basal diet of 169 Gm. of available glucose is so close to the previously determined tolerance of the patient (172 Gm.) that any appreciable absorption of the degradation products of inulin would have been reflected in the urinary sugar.

Additional evidence as to the rôle of inulin is given by the glucose content of the blood. On the morning of the first day during which inulin was fed the fasting blood sugar was 150 mg. per 100 cc., while after feeding inulin for three days the blood sugar was 147 mg. On the last day of the experiment the blood sugar

TABLE III.—FECES AND BLOOD ANALYSES.

| | Feces. | | | Blood. | | |
|---|---|---|---|---|---|---|
| Day. | Weight, Gm. | Nitrogen, Gm. | Fat, Gm. | $p_H$. | Sugar, mg. per 100 cc. | Nonprotein, nitrogen, mg. per 100 cc. |
| 31 | | | | 7.45 | 150 | 32.4 |
| 32 | 74 | 0.9 | 4.2 | | | |
| 33 | 74 | 0.9 | 4.2 | 7.34 | 147 | 33.0 |
| 34 | 74 | 0.9 | 4.2 | 7.32 | | |
| 35 | 74 | 0.9 | 4.2 | | | |
| 36 | 74 | 0.9 | 4.2 | | | |
| 37 | 74 | 0.9 | 4.2 | 7.44 | 156 | 27.3 |

was 156 mg. During a similar period where the whole dried artichoke powder was fed the blood sugar rose to 190 mg. It is evident from this that inulin did not affect the blood sugar level as would be expected had there been any increased absorption of carbohydrate.

It was thought that since inulin frequently gives rise to intestinal fermentation, some change might be observed in the $p_H$ of the feces. Table III gives these data which remained constant and at the same level as during the basal diet alone.

If we calculate the apparent tolerance of the subject to inulin, we get a daily average of 182 Gm. for the seven-day period. This is 10 Gm. higher than the

TABLE IV.—INULIN PERIOD: CARBOHYDRATE, INTAKE, OUTGO AND TOLERANCE.

| Day. | Intake, Gm. | Outgo, Gm. | Tolerance, Gm. |
|---|---|---|---|
| 31 | 199 | 4.3 | 195 |
| 32 | 199 | 3.8 | 195 |
| 33 | 199 | 3.1 | 196 |
| 34 | 191 | 3.5 | 188 |
| 35 | 169 | 0 | 169 |
| 36 | 169 | 3.6 | 165 |
| 37 | 169 | 0 | 169 |
| | | Apparent tolerance | 182 |

tolerance previously (1) determined for this patient.

That this increase in tolerance is not real but only apparent is evidenced by these data and has been discussed above.

SUMMARY.

A diabetic having a sugar tolerance of 172 Gm. of glucose was fed 112 Gm. of inulin during four days' time in addition to a basal diet yielding 169 Gm. of available glucose. There was no increase in either blood sugar or urine sugar from which we conclude that the inulin was not utilized but was probably destroyed in the intestines. Inulin prepared from artichokes is of no value as a source of carbohydrate to a diabetic.

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## THE LEAF OILS OF WASHINGTON CONIFERS: V. PICEA SITCHENSIS.

BY ARNOLD J. LEHMAN AND E. V. LYNN.

*Picea sitchensis*, or tideland spruce, is the greatest of all spruce trees, being rarely surpassed in massiveness of trunk and height of stem, and there are few more beautiful and impressive sights. Indeed, a view never to be forgotten by those who have visited the forests of Washington is that of a mighty spruce, with its spire-like crown raised high above the broad base of the graceful sweep of its long branches, whose lustrous foliage, now silvery white, now changing to varied shades of green, justifies the title of "the loveliest cone-bearing tree in America."

It is usually about 100 feet high, with a trunk tapering from 3–4 feet at just above its much enlarged base. Occasionally it is found growing 200 feet tall, with a trunk 15–16 feet in diameter but, at the extreme northern limits of its range, it is reduced to a low shrub. The upper branches are short and ascending to form an open, spear-like head, while the lower ones on older trees sweep out in long, graceful curves. The bark is scaly and cinnamon-red to red-brown. The leaves stand out from all sides of the branches, often at right angles, and frequently bring their white upper surfaces to view by a twist at the base. They are 3–12 mm. long and a lustrous green on the lower surface. The cones are 6–10 cm. long and, when full grown, tinged dark red on a yellow-green back-ground. The seeds are full and rounded, pale reddish brown and 8–10 mm. long, usually with four to five cotyledons.

The tideland spruce inhabits moist, sandy soil which is often swampy, or less frequently at the far north wet, rocky slopes. It grows at altitudes along the coast up to 2500 feet, gradually becoming smaller away from the ocean.

The material for the present investigation was obtained from trees growing in a wet, semi-swampy region, possessing a sandy, alluvial soil. The trees were cut down and the leaves and twigs collected. The oil for examination was secured by immediate steam distillation, 170 cc. being produced from 933 pounds. Cohobation of the distillate gave an additional 80 cc., or a total of 250 cc., equivalent to 0.059 per cent.

The oil when freshly distilled was light yellow, becoming slightly darker on standing, and possessed a disagreeable odor. Its general constants were: $d_{27°}$ 0.8806; $[\alpha]_D^{25°}$ —5.05; $n_D^{20°}$ 1.4684; acid number 2.04; saponification value 35.81, corresponding to 11.81 per cent of bornyl acetate and 9.28 per cent of isolated alcohol.

After removing the free acids with sodium carbonate solution, the oil was shaken with a 5 per cent solution of sodium hydroxide. This separated a small amount of a light yellow liquid with a powerful and penetrating odor similar to caraway. This boiled chiefly at 210–220° C. at 11-mm. pressure and did not solidify when cooled. The amount was too small to permit any further examination.

After washing and drying the residual oil, it was distilled under reduced pressure (5 mm.) up to 95° C. and purified by repeatedly distilling up to this temperature. Finally it was submitted to refractionation several times at ordinary pressures and the following portions collected: 154–160°, 1.5; 160–169°, 17.0; 169–174°, 12.0; 174–180°, 10.0; 180–190°, 10.0; 190–200°, 6.3 per cent of the total oil.

No pinene nitrosochloride could be obtained from the first fraction, from which one can conclude that $\alpha$-pinene is absent.

*Beta Pinene.*—The second fraction, which distilled chiefly at 164–166° C., was oxidized in the usual way with alkaline potassium permanganate. There was obtained from the acidified sodium salt by ether extraction a yellow oil which did not crystallize on long standing. It was, therefore, oxidized in acid solution by potassium permanganate, distilled with steam and the distillate was extracted with ether. The oily product was treated with semicarbazide hydrochloride as usual and the resulting crystalline substance was found too small in amount to permit positive identification. The oil was identified as nopinone by ultimate analysis, showing the presence of $\beta$-pinene.

0.0584 gave 0.1711 $CO_2$ and 0.0536 $H_2O$. Found: C, 77.7; H, 10.1. Calculated for $C_9H_{14}O$: C, 78.2; H, 10.1.

*Beta Phellandrene.*—The third fraction boiling chiefly at 169–174° C., was quite large. Treatment of 5 cc. in petroleum ether with nitrous anhydride at a low temperature produced white microscopic needles which melted at 101° C., showing the presence of $\beta$-phellandrene whose nitrite melts at 103° C.

The fourth fraction also contained some phellandrene, but no crystalline derivatives could be obtained with bromine or hydrogen chloride, showing the absence of dipentene or linonene.

The fifth fraction, boiling at 180–190° C., was a colorless, mobile oil with an odor resembling camphor and menthol. Analysis indicated that it contained mostly a compound of the composition $C_{10}H_{16}O$. When distilled under atmospheric pressure, it was found to boil almost constantly at 184° C. Treated with semicarbazide, it gradually formed clusters of long, glistening needles, and finally almost the entire oily layer became a solid mass. This was filtered, well washed with alcohol and pressed out on a porous tile. After drying at 100° C. for ten minutes, it melted at 231–232° C. Recrystallized from ether, in which it was sparingly soluble, this melting point was unchanged. The semicarbazone of camphor, which is one of the few with such a high melting point, was found to depress the melting temperature to a gradual one of 230–233° C. Hydroxylamine produced with the fraction

an uncrystallizable oil and, as no evidence of the presence of camphor could be obtained, it was concluded that the fraction contained a new ketone. Amount of material precluded further investigation.

*Camphor.*—The last fraction had a very pronounced camphoraceous odor. Upon treatment with hydroxylamine in the usual way, there was obtained a product which gradually solidified and which, after recrystallization from alcohol, melted at 117–118° C. This confirmed the presence of camphor, but a semicarbazone prepared from the fraction was found to melt gradually at 230–234° C., showing admixture with the ketone in the previous fraction.

*Saponification.*—The oil from which the terpenes had been removed was hydrolyzed by alcoholic potash in the usual way. After adding water to the dealcolized liquor, the saponified oil was extracted with ether and submitted to fractional distillation under atmospheric pressure. The results were:

200–208°, 1.0; 208–216°, 7.5; 216–222°, 6.3; 222–230°, 8.7; 230–240°, 5.5; 240–260°, 1.5 per cent of the total oil.

The first fraction was found to contain camphor and probably was mostly of this substance, although the amount was too small to get more than a semicarbazone.

*Borneol.*—The second fraction, which distilled chiefly at 208–212° C., solidified when cooled to a low temperature. Recrystallized from petroleum ether, the product melted at 203–204° C. The identity as borneol was further confirmed by oxidation to camphor melting at 175° C.

*Terpineol.*—The analysis and other properties of the third fraction indicated the presence of terpineol, but hydriodic acid gave a light yellow oil which did not crystallize after some time. Another portion was submitted to oxidation with chromic acid and, after end of the reaction, distilled with steam. The appearance of solid camphor in the condenser showed that the fraction contained some borneol. The aqueous residue was completely extracted with ether, which was separated, washed with sodium carbonate solution, and finally dried and evaporated. This process gave a yellow oil which soon crystallized to white granules which melted at 119° C. In all other properties this agreed with the indifferent body obtained by Wallach (1) as an oxidation product of terpineol, melting point 121–122° C.

The sodium carbonate solution from the above oxidation was acidified and extracted with ether, producing some of the indifferent body already mentioned and a small quantity of fine needles. These were identified as terebic acid which is also an oxidation product of terpineol. Attempts to prepare a phenyl urethane from the original fraction were unsuccessful, but it may be concluded that terpineol is probably present in small amounts.

The other three fractions were yellow and with odors reminding of camphor. Analyses indicated a large percentage of hydrocarbon, but no identifications could be made in any of the fractions.

*Picene.*—That portion of the oil boiling above 260° C. was fractionated at a pressure of 60 mm. Almost the entire residue passed over at 210–220° C. and represented about 5 per cent of the original oil. The liquid was greenish yellow and pleasantly aromatic and, when cooled in a freezing mixture for two hours, deposited a few needle-like crystals, which could not be readily separated because they dissolved again on raising the temperature slightly. A portion of the fraction was

dissolved in anhydrous ether and saturated with dry hydrogen chloride. At the end of three days the solvent was allowed to evaporate spontaneously, leaving a large amount of solid which crystallized from ethyl acetate in colorless, rectangular plates melting at 133° C. Analysis of a partly purified product showed probably a trihydrochloride:

0.1065 gave 0.1370 AgCl. Found: 31.8. Calculated for $C_{15}H_{24}.3HCl$: 33.9 per cent of chlorine.

The molecular refraction, however (66.6) was somewhat too low for a monocyclic compound.

Since the boiling point and analysis of this fraction indicated the chief material as a sesquiterpene and no such compound with a hydrochloride of this melting point has before been described, we propose to designate the substance as "picene." The same substance was already found, together with cadinene, in the oil from *Tsuga heterophylla* (2). Picene has an odor like that of citronella oil and a cineol-like taste. Its specific gravity is 0.8997 at 25° C., the index of refraction at 20° C. is 1.4990, and the specific rotation in 1.4 per cent alcoholic solution is —80.33° at 25° C. It gives color reactions with acetic and sulphuric acids, similar to those of cadinene.

*The Acids.*—The alkaline liquid from saponification was acidified and distilled with steam. No acid was found in the distillate except a very small quantity of an oil which had the rancid odor of butyric acid. The residual liquid was made alkaline with sodium carbonate and extracted with ether, producing a crystalline paste. After purification, this became a white crystalline mass which melted sharply at 112° C., evidently a lactone.

After separation of the lactone, the sodium carbonate solution was made acid and again extracted with ether. After washing and drying the ethereal solution, the solvent was evaporated, leaving a liquid with an unpleasant odor. Distillation gave but one fraction at 220–260° C.

0.0383 gave 0.0955 $CO_2$ and 0.0396 $H_2O$. Found: C, 68.1; H, 11.4. Calculated for $C_9H_{18}O_2$: C, 68.3; H, 11.3.

This corresponds with nonylic acid, but the amount was too small to permit closer identification. From the results, it would be presumed that several other acids are present in small quantities.

## SUMMARY.

The leaves and twigs of *Picea sitchensis* furnish a volatile oil to the extent of 0.059 per cent. The terpenes, which constitute more than 40 per cent, are chiefly β-pinene and β-phellandrene. Camphor and a new ketone (semicarbazone melting point 231–232° C.) are present, as also borneol and smaller amounts of terpineol. From the highest fractions was separated the hydrochloride of a new sesquiterpene, picene, whose constants are described. A lactone melting at 112° C. was isolated as saponification product. The acids appear to be chiefly nonylic acid and smaller amounts of butyric and others.

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# PHYTOCHEMICAL STUDIES OF SEVERAL OREGON PLANTS I.*

BY H. M. BURLAGE.

## ARTEMISIA HETEROPHYLLA, NUTT., COMPOSITÆ (*A. suksdorfii*, PIPER).

A mild climate and an abundance of rainfall for the greater portion of the year present ideal conditions for plant growth in northern California and the Pacific Northwest. The vegetation, therefore, includes a wide variety of plants, many of which, no doubt, have a medicinal value and have never been studied. With this idea in mind a systematic study of some of these plants, particularly those which showed evidences of a volatile oil as one of the important and conspicuous constituents has been undertaken. This report is a preliminary one on investigations which were started in July 1927.

An examination of literature reveals that approximately three hundred and eighty species of Artemisia have been identified (1). Forty-six species have been subjected to a chemical study. Only a few of these, however, have been examined with any degree of completeness and such studies have been confined chiefly to an examination of the volatile oil if present in sufficient quantity and to detect the presence of santonin, an expensive and valuable medicinal agent, which has been found in a few species. Twenty species are listed in a text on Northwest Flora (2), six of which have been examined to various degrees and reported in literature. A complete bibliography of these studies will be included in a later and more complete report.

*A. heterophylla*, Nutt. is a perennial plant, 90–150 cm. high, having, when crushed, a penetrating camphoraceous odor and a bitter taste. The leaves are alternate, numerous, oblong-lanceolate, acute, entire to cleft or lobed, 6–20 cm. long, 3–8 cm. wide, of bright green color above, and white-tomentose beneath. The heads are numerous, arranged in pyramidal panicles, which are dense and 15–45 cm. long, small (3–4 mm. high), and many-flowered. The flowers are pale yellow or yellowish and tubular; the disc flowers are perfect and fertile; the marginal flowers are pistillate and fertile. The involucre is pale green, glabrous to pubescent and cylindric; the tegules are obtuse and hyaline-margined. The flowers when observed hastily remind one of the Golden-rod, hence the plant has been given the common name "Golden-rod Sage."

The herb grows profusely throughout the western portion of the Pacific Northwest along roadways, the seashore, fence rows and more abundantly in regions that are apt to be overflooded during the rainy months. An abundant supply of moisture seems necessary for vigorous growth since it has been found that plants growing on hillsides and banks where sub-irrigation is not adequate were found to be low and decidedly woody.

As stated above the plant is often taken for a Golden-rod but when examined more closely the foliage is found to be quite different and to possess a characteristic odor. Examination of literature indicates that this species has evidently not been examined. Since the plant grows so abundantly in this region a chemical study to ascertain the possibilities of the herb for commercial use was thought to be advisable.

Since, in general, there is a great analogy between the species of the same

* The writer wishes to extend his appreciation to Dr. Helen M. Gilkey of the Department of Botany, Oregon State College for the efforts expended in the identification of the plants included in this study and others which were presented to her from time to time. Thanks are also extended to the Oregon State Board of Pharmacy for the use of its equipment and its permission to carry on a portion of this study while the writer was in its employ.

genus, both morphologically and chemically, the results which have been found in studies on other species have been carefully examined.

Without doubt, the volatile oil is an important ingredient and this report will include a preliminary investigation of the plant and its volatile oil.

The material used in the present investigation was collected chiefly in Linn county of the Willamette valley near Corvallis, Oregon, during 1927–1928. In order to determine, if possible, the proper time of collection for maximum oil content or for other valuable properties, the plant was harvested during several months, each lot being treated separately.

Samples of the fresh material were dried to constant weight at room temperature and then at 105° C. The total ash and acid-insoluble ash were determined. Small portions of the air-dried drug were subjected to successive extractions with petroleum ether, ether, alcohol, and water and the residues carried to constant weight at room temperature and then at 105° C. The results obtained were calculated on a completely dry basis. The results follow:

TABLE I.

| | Leaves. | | | Tops. | |
|---|---|---|---|---|---|
| Total ash | 7.73% | | | 8.12% | |
| Acid-insoluble ash | 1.84 | | | 2.26 | |
| Loss on air-drying | 61.24 | | | 65.12 | |
| Loss at 105° C. | 4.98 | | | 5.15 | |
| Total volatile | 66.22 | | | 70.27 | |
| Petroleum ether extract total | 3.72 | 3.40 | ..... | 2.06 | 2.01 |
| Non-vol. at 105° C. | 3.20 | 2.88 | ... | 1.52 | 1.35 |
| Ether extract total | 4.41 | 4.06 | ... | 2.34 | 2.39 |
| Non-vol. at 105° C. | 3.01 | 2.86 | ... | 1.87 | 1.63 |
| Alcohol extract total | 3.20 | 5.34 | ... | 2.72 | 2.35 |
| Non-vol. at 105° C. | 2.60 | 3.66 | ... | 2.24 | 1.90 |
| Water extract at 105° C. | 14.33 | 17.19 | ... | 12.34 | 11.14 |

## THE VOLATILE OIL.

The leaves and tops were harvested by stripping from the stalk of the plant. Each lot was subjected to steam distillation until no more oil was obtained. The latter was separated by means of an automatic separator, the watery liquid was cohobated, and the final traces of oil were removed by ether extraction. The collected oil from each lot was dried over anhydrous sodium sulphate and measured in a graduated cylinder. The physical constants were determined. The results are shown in the following table:

TABLE II.

| Collection. | Yield. | Color. | $d_{20}$. | $(\alpha)_{D20}$. | $n_{D20}$. |
|---|---|---|---|---|---|
| Sept. 1927 | 0.86% | Olive to golden | 0.9478 | +23.48° | 1.4196 |
| October* | 0.88 | Golden to straw | 0.9492 | +32.10° | 1.4944 |
| November† | 0.77 | Straw | 0.9187 | +28.74° | 1.4896 |
| December | 0.69 | Straw | 0.9546 | +26.78° | 1.4880 |
| July 1928 | 1.10 | Blue | 0.9639 | +39.95° | 1.4824 |
| August* | 1.72 | Green-yellow | 0.9530 | +13.08° | 1.4852 |
| September† | 1.02 | Blue-green | 0.9601 | − 0.91° | 1.4902 |

(Solubility 1 part in 1.1 parts of 80% alcohol (by vol.).)

* Full flowering. † First killing frost.

Seasonal observations do not show sufficient regularities to draw any definite conclusions as to the proper time to gather the herb in order to obtain maximal yields of oil. It would seem, however, that the proper time is at full flowering. The summer of 1927 according to the laity was not a normal growing season for Oregon; the late spring was followed by a correspondingly late fall and late flowering season. The summer of 1928 was quite normal and it will be noted that the time of flowering was much earlier and the yield of oil much higher. A sharp decline in the yield of oil is noted after the first killing frosts, indicating consumption of the oil in catabolic processes or to frost effects on cell structure with a subsequent evaporation of the volatile oil.

In most cases the oil showed the presence of a blue constituent which was not so evident in samples procured from materials affected by frost. Later work showed the blue substance to be affected by acid; this might indicate the presence of a plant indicator, which was highly soluble in the oil. Fractionations showed the blue constituent to be present in the higher boiling fractions, indicating a possible presence of azulene, a blue-colored constituent often present in volatile oils. The blue color of azulene, however, is quite permanent; the blue fractions obtained soon lost this color, indicating some substance that is readily oxidized. It is hoped that subsequent experiments will indicate what this substance might be. In general, it is noted that there is a maximum value for all physical properties with a decline (?) after the first killing frost, indicating a sharp change in chemical composition of the oil.

In order to gain some idea of the components of the oil, each lot was examined for total esters, free acids, aldehydes and ketones, alcohols and phenols. The acid value and the saponification value were determined by the Pharmacopœial processes (3) and the ester number found by subtraction. The acetylization was made according to Semmler (4) and the value calculated by subtracting the saponification value before acetylization from that after acetylization. The percentages of free acids, phenols, and aldehydes and ketones were estimated by shaking known volumes of the oil successively and respectively with 5 per cent sodium carbonate, 5 per cent sodium hydroxide, and 35 per cent sodium bisulphite solutions in a flask with a graduated neck and observing the dimunition in volume. The results follow:

TABLE III.

| Leaves and tops. | Acid value. | Sapon. value. | Acetyl. value. | Ester value. | Free acids. | Phenols. | Aldehydes, ketones. |
|---|---|---|---|---|---|---|---|
| September 1927 | 2.75 | 41.37 | 46.30 | 38.62 | 9.0% | 6.0% | 3.0% |
| October | 8.26 | 35.40 | 40.44 | 27.14 | 19.0 | 6.0 | 4.0 |
| November | 10.73 | 42.22 | 191.94 | 31.49 | 21.0 | 6.0 | 4.0 |
| December | 12.63 | 51.97 | 201.43 | 39.34 | .. | ... | ... |
| July 1928 | 3.20 | 24.66 | 49.70 | 21.46 | 4.0 | 6.0 | 0.0 |
| August | 3.02 | 23.36 | 48.20 | 20.34 | 6.0 | 8.0 | 2.0 |
| September | 2.83 | 36.82 | 81.40 | 33.89 | 10.0 | 4.0 | 2.0 |

A study of the data above shows the effect of normal growth and natural destructive agencies as frost on the respective chemical constants indicating energy changes necessary for the maintenance of the life processes within the plant.

HERACLEUM LANATUM, MICHX. (UMBELLACEÆ.)

*H. lanatum*, commonly known as Cow Parsnip, is a tall stout perennial, 1–2.5 m. high, and wooly. It is named after Hercules because of its size and stoutness. The stem is grooved, 3–8 cm. thick. The leaves are large, ternately compound with leaflets, 10–25 cm. wide, and round cordate. The flowers are white, involucre deciduous; umbels large with many rays, 5–15 cm. long. The fruit is broadly obovate, 8–12 mm. long, and dorsally much flattened. A microscopic study of the herb will be included in a later report.

The herb is widely spread throughout the central, Rocky mountain and western portions of the United States according to various books on flora (5). In the Willamette valley of western Oregon the plant thrives in great abundance along the banks of streams, drainage ditches, and fence rows.

The writer's attention was attracted to the plant by reports from various sources of fatal poisoning of cattle when the young shoots of the plant are eaten in the spring. Pammel (6), however, states that the fresh leaves have been eaten by the Indians and that a bitter principle, heraclin, $C_{32}H_{29}O_{10}$ is present. Hyams (6), on the contrary, states that the herb is poisonous and Halsted (6) reports that blisters are produced by the plant. Tests show that methyl alcohol is present and it has been asserted that the poisonous properties might be due to this substance; it is doubtful, however, that this alcohol is present in the quantity necessary to produce fatal effects unless consumed in extremely large quantities.

A study of the literature reveals that five species have been examined more or less completely. The oil of *H. giganteum*, Hort. (*H. villosum*, Fisch.), and *H. sphondylium*, L. have been examined quite thoroughly but no mention has been made of a poisonous constituent in the plant. It was decided to examine the oil of the species *lanatum* and carry on an exhaustive study of the constituents of the herb in order to ascertain the presence of poisonous ingredients other than methyl alcohol. The present report includes preliminary studies on the various extracts and the constants of the volatile oil. A complete bibliography will be included in a later report.

The air-dried ground fruits were subjected to successive extractions with petroleum ether, ether, alcohol, and water and the residues were brought to constant weight at room temperature and finally at 105° C. The results follow:

TABLE IV.

| | Stems. | Fruits. | |
|---|---|---|---|
| Total ash | 6.20% | 6.50% | |
| Acid-insoluble ash | 1.27 | 5.30 | |
| Petroleum ether extract total | | 4.37% | 3.04% |
| Non-vol. at 105° C. | | 4.25 | 2.71 |
| Ether extract total | | 2.44 | 2.36 |
| Non-vol. at 105° C. | | 2.25 | 2.32 |
| Alcohol extract total | | 3.98 | 3.41 |
| Non-vol. at 105° C. | | ... | 3.38 |
| Water extract total | | 18.29 | 13.78 |
| Non-vol. at 105° C. | | 14.77 | 10.72 |

The ash was found to contain considerable amounts of iron.

THE VOLATILE OIL.

Preliminary experiments showed the volatile oil to be chiefly in the fruits; the stems although possessing the characteristic odor of the oil yielded but a very

small amount. It was also found necessary to dry and grind the fruit in order to bring about a complete removal of the oil by steam distillation without a great deal of trouble and expenditure of time. The fruits were collected during various months of the year and each lot was steam distilled in order to determine if possible the proper time of gathering.

The oil from each lot was dried over anhydrous sodium sulphate and was then measured. The physical constants were determined and the yield of oil calculated on the dried herb.

TABLE V.

| Collection. | Yield. | Color. | $d_{25}$. | $(\alpha)_{D20}$. | $n_{D25}$. | Sol. in 80% alcohol. |
|---|---|---|---|---|---|---|
| June 1928 | 0.26% | Straw | 0.8698 | +0.93° | 1.4288 | ..... |
| July | 0.57 | Pale straw | 0.8680 | −0.28° | 1.4290 | ..... |
| July 1929 | .. | Very pale | 0.8640 | −0.07° | 1.4268 | 1 in 1.2 or more |
| Oil of H. sphondylium (7) | | | | | | |
| (1) Umbel oil | 0.08 | Brown-yellow | 0.9273* | −0.80° | .... | 1 in 1.1, turbid in more |
| (2) Fruit | 0.90 | .... | 0.8744 | +0.63° | .... | 1 in 0.8 and more |
| (3) Fruit | 1.21 | .... | 0.8798 | +1.10° | .... | 1 in 1 and more |
| Oil of H. giganteum (7, 8, 9) | | | | | | |
| (1) | 3.6 | .... | 0.8722 | +1.23 | .... | 1 in 1.8 |
| (2) | 2.9 | .... | 0.8738 | +1.00° | 1.4240 | 1 in 1 |
| (3) | .. | .... | 0.8695 | +0.35° | .... | ..... |

* 15° C.

It has been found that the time of collection for maximal yield of oil is the stage just before the fruits assume the "dead" ripe appearance. Much loss of fruit is encountered by shattering if the time of gathering is postponed until a later time than that mentioned above. The fruits of the June gathering above were green to slightly brown; the July collection consisted of fruits entirely brown. A decided increase in oil yield is noted.

TABLE VI.

| Oil. | Acid value. | Sapon. value. | Acetyl value. | Ester value. | Free acid. | Phenols. | Aldehydes, ketones |
|---|---|---|---|---|---|---|---|
| June 1928 | 5.30 | 249.70 | | 244.40 | 2.0% | 1.0% | 1.0% |
| July | 3.40 | 266.90 | 48.00 | 263.50 | 5.0 | 2.0 | 2.0 |
| July 1929 | 2.40 | 256.30 | 33.20 | 253.90 | 1.0 | 1.0 | 1.0 |
| Oil of H. sphondylium (7) | | | | | | | |
| (1) Umbel | 16.2 | 164.8 | 31.1 | 148.6 | ... | ... | ... |
| (2) Fruit | 15.9 | 231.3 | 54.0 | 215.4 | ... | ... | ... |
| (3) Fruit | 7.3 | 249.7 | 26.6 | 242.4 | ... | ... | ... |
| Oil of H. giganteum (7, 8) | | | | | | | |
| (1) | 1.6 | 286.7 | 25.9 | 288.3 | ... | ... | ... |
| (2) | 3.7 | 284.7 | 26.3 | 281.0 | ... | ... | ... |

The table shows a reasonable comparison with other samples of oil of the same genus. A more complete examination of the oil is being conducted to determine, if possible, all of its constituents.

Each lot was examined for total esters, acids, aldehydes, and ketones, and phenols. The acid and saponification values were determined by the Pharmacopœial methods (3) and the ester number found by subtraction. The acetyl

value was determined by the method described by Semmler (4) and calculated by subtracting the saponification value before acetylization from that obtained after acetylization. The percentages of free acids, phenols, aldehydes and ketones were estimated by shaking definite quantities of the oil successively and respectfully in a flask with a graduated neck with 5 per cent sodium carbonate, 5 per cent sodium hydroxide, and 35 per cent sodium bisulfite and observing the dimunition in volume of the oil. The results are shown in Table VI.

MELISSA OFFICINALIS, L., MENTHACEÆ.

Lemon mint, Balm, Common Balm, or Garden Balm—common names for the herb—attracted the writer's attention because of several inquiries received concerning the commercial possibilities of the plant. It is to be found in dense patches in the Williamette Valley of Oregon and examination of the source of supply showed these beds to be escaped from gardens and farm yards where the mint had been grown for flavoring purposes and because of its pleasant, characteristic lemon-like odor. The patches were sturdy growths of unusual and profuse size, indicating that the herb might easily be grown for commercial use if the demand were sufficient for its cultivation. Literature revealed very little concerning the constants and chemical constituents of the oil derived from the herb. It was decided to confine our efforts to a study of these values.

The plant has been described in "Gray's Manual" (10) and more completely in a treatise on northwest flora by Frye and Rigg (10).

The herb shows the presence of 74.5% total volatile material; total ash content was 6.2%; and insoluble ash 5.0%; iron and aluminum were indicated in the ash. When subjected to steam distillation and subsequent cohobation and extraction of the aqueous distillate the herb yielded approximately 0.13% oil with a golden-yellow color and a pleasant lemon-like odor. A table of comparison of the constants follows:

TABLE VII.

| | Oregon oil. | Spanish oil (11). | Oil of *Melissa calamintha* (11). 1. | 2. |
|---|---|---|---|---|
| $d_{20}$ | 0.9632 | 0.8910* | 0.8759 | 0.8771‡ |
| $(\alpha)_{D20}$ | −10° 6′ | +2° 8′** | −28° 12′† | −16° 57′ |
| Solubility in alcohol | Insol. in 20 parts of 80% alcohol | Sol. 1 part in 2 parts of 80% alc. | Insol. in 10 parts of 90% alcohol | Insol. in 10 parts of 90% alcohol |
| $N_{d20}$ | 1.4999 | 1.4704** | 1.4951† | 1.4911 |
| Acid value | 9.28 | ..... | ..... | ..... |
| Saponification value | 34.41 | ..... | 4.5 | 8.3 |
| Acetyl value | 43.30 | 236.0 | ..... | 38.95 |
| Ester value | 25.13 | 27.4 | 4.5 | 8.3 |
| Free acids | 2.0% | ..... | ..... | ..... |
| Phenols | 4.0% | ..... | ..... | ..... |
| Aldehydes and ketones | 17.0% | 42.0% | ..... | ..... |

* 25° C. ** 22° C. † 16° C. ‡ 15° C.

Flatau and Labbe (12) on examination of a Spanish oil reported 6 per cent citronellal, 20 per cent geraniol and 12 per cent linalol (after saponification).

Since there is no particular demand for the oil no further work was attempted.

MICROMERIA DOUGLASII, BENTH., MENTHACEÆ (*M. chamissonis*, GREENE).

*M. douglasii*, commonly known as Yerba Buena or Tea Vine, is a prostrate perennial vine, 30 to 100 cm. in length with orbicular or ovate, and dentate leaves, 6 mm. to 50 mm. long. The

flowers are small, few, in the leaf axils, white or pale lavender. The herb is found growing in shaded places and more profusely along shaded banks of streams. It is easily identified by its pleasant minty and balsamic odor which distinguishes it from the very similar Twin-flower (*Linnaea americana*, Forbes, *Caprifoliaceæ*). It differs further from this plant by having the characteristic square stem of the mint family. A survey of literature shows that all of the physical and chemical constants have not been reported and it was deemed advisable to report such determinations on the Oregon product.

Lynn and Cheng (13) have found that drying the herb before steam distillation tends to dissipate the volatile components almost entirely. Our experience substantiates this statement and accordingly the fresh herb was subjected to steam distillation. Apparently the proper time to collect for maximum yield of oil was just before or at the time of flowering. Experiments, however, were not carried out to prove this statement. Cohobation and extraction yielded 0.25 per cent of a pale green oil with a delightful balsamic, minty odor. Upon standing the color of the oil gradually changed to a golden tint.

A solid substance deposited in the condenser upon cohobation. This substance with respect to some of its physical properties resembled menthol. The amount, however, was too small to permit further study. Lynn and Cheng (13) have noted this solid substance while Power and Salway (14) have reported a semi-solid substance which they identified as palmitic acid. It is quite likely, however, that menthone and menthol are present, since Murayama (15) has identified these substances in the oil of *M. japonica*, Miq. (yield of oil $-0.7\%$) and since analogy in composition is generally shown between species. Owing to the small amount of oil present in the herb, for which apparently there is no great commercial demand and to the difficulties involved in gathering no further work was done other than determinations of physical and chemical constants reported in the following table of comparison:

TABLE VIII.

| | Oregon oil. | Western oil (14). A.† | B.* |
|---|---|---|---|
| Yield | 0.25% | 0.16% | 0.5% |
| $d_{20}$ | 0.9217 | 0.9244 | 0.9450 |
| $(\alpha)_{D20}$ | $-21° 3'$ | $-22° 48'$ | $-26° 44'$ |
| Solubility in alcohol | Sol. 1:10 of 80% alc. | Not sol. in 10 vol. 70% alc. | Easily sol. in 70% alc. |
| $N_{d20}$ | 1.4572 | ..... | ..... |
| Acid value | 6.06 | ..... | ..... |
| Saponification value | 27.01 | ..... | ..... |
| Acetyl value | 55.54 | ..... | ..... |
| Ester value | 20.95 | ..... | ..... |

† Pale yellow-brown oil.

* Yellow-brown oil obtained by alcoholic extraction.

## SUMMARY.

1. A preliminary report on *Artemisia heterophylla*, Nutt. and its oil is made. The various extracts of the herb and constants of the oil are found. Work is being continued and an extended bibliography will be offered later.

2. A preliminary report of *Heracleum lanatum*, Michx. and its oil is given. The various extracts and constants of the oil are given with comparative values for other oils of the same genus. Examination of the oil and the herb is being continued to ascertain any poisonous ingredients. The results of the examination and an extended bibliography will be offered in a later report.

3. The physical and chemical constants of the oil of *Melissa officinalis*, L. and *Micromeria douglasii*, Benth. are reported.

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## PEPPERMINT MONOPOLY IN JAPAN REFUTED.

At a meeting called by the Japanese Minister of Home Affairs, at which the governors of all the prefectures in Japan were present, it was stated that, if a peppermint monopoly were established, dementholized peppermint oil of uniform grade could be offered to exporters and the monopoly would be able to curtail sales of peppermint oil and thus stabilize the price. No particular details as to the method of procedure were discussed, and it is believed that at present no investigation of this matter is being made either by the Monopoly Bureau, or by the Hokkaido Prefectural Government.

One of the largest dealers and exporters of peppermint oil states that dealers were not in sympathy with the idea and that resolutions to that effect were drawn up and presented to the Department of Commerce of Japan. (Assistant Trade Commissioner H. B. Titus, Tokyo.)

## EFFECT OF METHANOL ANTI-FREEZE ON HEALTH.

Surgeon General H. S. Cumming of the United States Public Health Service, when asked regarding the statement issued December 6th by the Bureau of Mines on the effect of methanol anti-freeze on health, stated that the Public Health Service had kept in touch with the observations being made by the Bureau of Mines on the subject, and that he felt there was need for the immediate release of information which would protect the general public. It appeared from the study so far that there was much more danger from exhaust gas (carbon monoxide) than could possibly come from methanol when used strictly as an anti-freeze liquid in automobiles.

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## DANISH OINTMENT.

According to the *Pharmaceutical Journal and Pharmacist* of November 22, 1930, page 515, Danish Ointment was first introduced by Marcussen in 1911, who published the formula about a year later. This ointment has been frequently prescribed of late for the treatment of scabies, either under the above name or as the proprietary, Kathiolan. It is prepared as follows: (1) Dissolve sublimed sulphur 1000 Gm. in a hot solution, 50 per cent (w/w), of potassium hydroxide, 1000 Gm.; (2) mix together anhydrous lanolin and soft yellow paraffin of each 225 Gm.; (3) to this mixture add 375 Gm. of the clear sulphur solution; (4) prepare fresh zinc hydroxide by mixing an aqueous solution, containing zinc sulphate 28 Gm. with 40 Gm. of a 20 per cent solution of sodium hydroxide. The precipitate should be washed and added to the ointment; (5) make up the ointment to 1000 Gm. with sufficient liquid paraffin; and (6) mask the odor of hydrogen sulphide with benzaldehyde, 5 Gm.

The method of application consists in the patient first taking an ordinary bath, and after thorough drying, the whole body except the head is covered with the ointment. Twenty-four hours later a second bath is taken and fresh underclothings used, and the cure is then considered to be complete.

There has been considerable criticism of this formula, various authorities being of the opinion that the quantity of potassium hydroxide prescribed is insufficient, while others have been able to prepare satisfactory solutions with the amount indicated. The following suggestions are made where difficulty is experienced in dissolving the sulphur: (1) A larger amount of potassium hydroxide should be used; (2) a saturated solution of $H_2S$ in half the prescribed amount of KOH solution can be substituted; and (3) the gradual sifting of the sulphur into the hot caustic potash solution with constant stirring and allowing this to stand over night and then decanting and filtering the liquor on the following morning.

## CORN SUGAR.

Secretary Hyde's ruling on corn sugar may prove to be of far-reaching importance. The ruling is an administrative change which permits corn sugar to be used in the packing and preparation of foods without being designated as such. Its effect will be to stimulate the corn sugar industry and it may tend to relieve overproduction of corn.

Refining processes have been so perfected that a clear, white, granulated sugar is now made from corn. The Department of Agriculture has found that it is 75 per cent as sweet as cane sugar; that it has some properties more valuable than cane sugar, and that it is a wholesome and healthful food. The fact that it required a special label gave it a mark of inferiority in the public mind, hence, manufacturers of prepared foods would not use corn sugar, even though they recognized its wholesomeness.

Corn sugar should not be sold as cane sugar and, if the facts relating to it are given to the public, existing prejudice will be removed. There seems to be no objection to its use in canned goods, but there may be for pharmaceuticals.

# DEPARTMENT OF BUSINESS MANAGEMENT

Conducted by Paul C. Olsen.*

## COMMENTS, QUESTIONS AND SUGGESTIONS ARE INVITED AND WELCOME.

Readers are invited to submit comments, criticisms and suggestions regarding the material which appears in this department. The Editor also will undertake to answer questions regarding general problems of business management. Letters of general interest will be published, but the writer's name will not be revealed without his permission.

## PRICE CUTTING—WHERE IS IT HEADING?

Price-cutting has been a factor in the drug trade for many years. Undoubtedly, it is true also that price cutting on standard identified merchandise has been on the increase in the United States in recent years.

Even if price cutting had not increased in this country, purchasers of drug merchandise in retail stores inevitably would have regarded price as of increasing importance. This is the certain accumulative effect of any long-continued selling effort based upon a single appeal.

But, as a matter of fact, cut prices have not only continued to be featured but have been featured in increasing degrees. This increase has resulted, in part, from the increased number of stores using cut prices on standard identified merchandise and, in part, from the increased number of items on which cut prices have been used.

Some of the present and future effects of this situation are, properly, to be regarded with alarm.

While price is, of course, a vital factor in the sale of many items in the drug trade, it is not the only one. The effect of continued promotion on a price basis is, however, to make price more and more the dominant factor and, correspondingly, relegate to an unimportant position, or disregard entirely, other factors of as great or greater importance than price.

Effects which already are apparent, and others which will be apparent, while the present trend continues, are interesting to note.

I have mentioned several times in these articles that one of the basic reasons for the existence of cut prices on popular identified merchandise is that the so-called full prices on this merchandise produce such extraordinarily high net profits that price cutting inevitably is tempted by merchants anxious to attract business to their stores.

One effect, therefore, of the continued emphasis upon the price of popular identified merchandise is likely to be the sale of this merchandise in all or practically all drug stores at prices which are lower than those now in effect in most of these stores. This tendency is already evidenced by the great number of popular 50-cent and $1.00 items which are sold at 45 and 90 cents in the large number of drug stores which do not feature cut prices.

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A second development which follows inevitably from this is the increased effort of retailers and wholesalers to promote brands which they control. When a feeling exists that price competition on popular identified brands is forcing prices to a level which is unprofitable, it is quite likely that the more aggressive retailers and wholesalers will make use of the technical knowledge and experience they have in manufacturing pharmacy to produce competitive articles on which they can control the price.

This is a condition which is especially likely to occur in the drug trade. In order to be a successful retailer or wholesaler it is necessary, as everyone knows, for the retail or wholesale merchant to have technical training and experience in manufacturing many of the classes of merchandise which he sells

Another effect of this in the medicinal field may be the increased promotion not only of proprietary items controlled by individual wholesalers and retailers but also a more determined effort to increase the use of staple drugs and chemicals in place of price-cut proprietaries designed for the same need.

A third effect which follows inevitably as a result of this increased interest by aggressive wholesalers and retailers in the promotion of their own merchandise is a corresponding increased effort by the manufacturers of price cut popular identified merchandise to produce more and more consumer demand for their products. This means more advertising and more powerful advertising of these nationally known items.

The effects of this plan are well known. No matter how low his profit, or how keen the price competition, no druggist dares not have in his stock merchandise which his customers want to buy. Manufacturers of popular identified merchandise, whose products are used in price wars, turn to consumer advertising as a means of protecting and increasing the demand for these products in spite of the lack of interest in them by wholesalers and retailers. As is well known, under present legal restrictions, many manufacturers of popular merchandise cannot specify the prices at which merchandise they sell at wholesale and at retail shall be resold. They thus are virtually powerless to prevent the continued sale of their products at ruinously low prices.

This condition has resulted in long continued demands for legislative and governmental relief from unfair price competition. The greatest justification for the passage of the Capper-Kelly Bill is the hope that it will eliminate or greatly reduce unfair price competition. Unfair price competition usually means price cutting to a point below the cost of the goods sold, thus falsely creating the impression that the price cutter can buy this merchandise and, presumably, other merchandise, at prices lower than his competitors.

As suggested before, customers are not unconscious of this increased emphasis upon price in the sale, in the drug trade, of popular identified merchandise. Salespeople in stores which aim to be leaders in price-cutting have story after story to tell of people who shop from one store to another before making a purchase at the lowest possible price. Of course, these customers are the exception because of the comparatively small amounts involved in individual sales in drug stores. But a fifth effect of continued emphasis upon price in the drug trade has been, undoubtedly, to increase the number of bargain-hunters—the number of people who place price above all the other merits which merchandise can have.

Another type of customer, who is still in the minority, but who is increasing in numbers, is the person who plays upon the greed and gullibility of retail druggists overly price-conscious.

For instance, a woman customer in a drug store featuring low prices says, "How much is Zu Zu tooth paste?"

"Thirty-three cents, 3 for 89 cents," the salesman chirps brightly.

"But," says the sharp-eyed woman bargain hunter, "I can get it across the street for 29 cents, 3 tubes for 81 cents."

"You what!" shouts the salesman in great excitement, "Well, I'll be —. If they can sell it for 81 cents we can too, lady. We'll never be undersold. Here's your Zu Zu tooth paste, 3 for 81 cents."

In the rush of the day's business the incident is forgotten except to mark down Zu Zu to 29 cents, 3 for 81 cents. On his weary way homeward that night, however, the salesman may pass the blatant windows of his aggressive competitor. Imagine his surprise to find Zu Zu tooth paste in the window there, but priced at 33 cents, 3 for 89 cents.

What this druggist didn't know was, that this same woman had been in his competitor's store and had used there the same sharp device to obtain a well-known cold cream at 4 cents under this store's much reduced price.

This typical instance, while it is only representative of a small but growing number of retail druggists' customers, clearly shows that over-emphasis on price, in an effort to attract business, is fraught with complexities and dangers, some of them unanticipated.

Indeed, the great disadvantage of dependence upon price alone as a means of attracting business is the ease with which this method can be imitated and carried to greater lengths by competitors.

Thus, once again is demonstrated from economic facts the desirability for retail druggists to concentrate upon those aspects of pharmacy in which price competition is not a principal feature. The professional services of pharmacy are certainly in this class.

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## A SUMMARY OF THE RECORDS OF RECOVERIES FROM LEPROSY.

A report recently issued by the Public Health Service gives an interesting summary of the value of medical treatment for leprosy at the National Leprosarium which is conducted by the Public Health Service at Carville, La. More than 300 lepers, men, women and children, are under treatment there.

During the past ten years, 65 lepers have been discharged from this hospital as apparently recovered from leprosy and no longer a menace to the public health. The average period of hospital care varied from 5 to 9 years. The shortest period of treatment was $1^1/_2$ years and the longest was 17 years. Fifty-five of these patients received crude chaulmoogra oil by mouth, and sixteen of this group received no other medicine. Twelve received benzocaine-chaulmoogra oil by intramuscular injection, and four of these received no other medical treatment. Twenty-one received the ethyl esters of chaulmoogra oil by intramuscular injection, and eight of these received no other medicine.

The basic treatment of leprosy is similar to that for tuberculosis, and all lepers at the National Leprosarium, no matter what medicines are given, follow a sanatorium regimen of food, fresh air and rest; almost identical with that prevailing in a tuberculosis hospital.

In connection with this important work the name of our late fellow member, Dr. Frederick B. Power, should be remembered by pharmacists.

# COMMENTS ON SOLUTION OF MAGNESIUM CITRATE.

BY FREDERICK KLEINSCHMIDT.

It is the purpose of this article to show that a stable solution may be produced with considerable less Citric Acid than the U. S. P. prescribes.

The pharmacist, in making Solution of Magnesium Citrate has two points in view: a stable solution and a palatable article for sale.

In order to obtain a stable solution, Pharmacopœia Commissions in 1900 and again in 1910 concluded to increase the amount of citric acid to be used, with the result that we now have a product unnecessarily high in acidity, resulting in frequent complaints by consumers on account of its sour taste. We understand that only some States of the Union enforce this excessive citric acid content.

The precipitate which may form in Solution of Magnesium Citrate is known as $(C_6H_5O_7)\ Mg_3 + 14H_2O$ and also as $(C_6H_5O_7)\ Mg_3 + 13H_2O$. Either salt may form.

We have found that Solution of Magnesium Citrate, made according to the formula given below, which contains 20% less citric acid than the U. S. P. X formula, will not precipitate when subjected to a temperature of 150° F. for 20 minutes, and that it then remains clear for a number of months at room temperature.

We claim that during the warming of the solution a portion of the cane sugar is reduced to invert sugar, and it is this chemical process taking place in the warm solution which prevents the formation and consequent precipitation of the less soluble basic magnesium citrate,

$$C_{12}H_{22}O_{11} \longrightarrow + H_2O = 2C_6H_{12}O_6$$

Through the affinity for water of the invert sugar (formed during the heating process) the formation of magnesium citrate $+ 14H_2O$ or $+ 13H_2O$ is inhibited.

The saturation point of $CO_2$ in and above the solution materially influences the formation of the less soluble basic salt. The greater the saturation the less the chance of precipitation.

On page 945 of the JOURNAL A. PH. A. (September 1930) it is stated that the true solution of the precipitation problem is solved "(*a*) by a complete sterilization of the finished solution (including bottles and stoppers), and (*b*) proper sealing of the bottle." Of course, any liquid in a bottle and not properly sealed will deteriorate sooner or later. While sterilization may assist towards a permanent solution, we believe that it is the above-mentioned reaction taking place during the heating process which determines the stability of the solution. Complete sterilization is by no means the *sine qua non*.

Now as to Magnesium Carbonate. We know that magnesium carbonate is not a definite chemical but a mixture of $Mg\ CO_3 + MgO + H_2O$. This product continually varies as to its MgO and $H_2O$ contents. It absorbs moisture easily and fairly rapidly. The first U. S. P. requiring an MgO assay was that of 1900, namely, 40 per cent. Ten years later, at the request of some producers, the MgO was lowered to 39.2 per cent. In our experience as manufacturers of Magnesia our purchases of magnesium carbonate analyzed 40% MgO or over. It is therefore obvious that the MgO content of 40% was wisely adopted by the U. S. P.

of 1900 and should be retained. The acidity of this preparation is still more increased when a magnesium carbonate of 39.2% MgO content is used. The magnesium carbonate on the market usually assays between 40 and 41 per cent. Its quantity in the official formula should therefore be changed to 14 Gm.

From our extensive experience, we therefore recommend the adoption by the U. S. P. Revision Committee of the following formula:

| | |
|---|---|
| Magnesium carbonate 40% | 14 Gm. |
| Citric acid | 28 Gm. |
| Sugar | 35 Gm. |
| Sodium bicarbonate | q. s. |
| Flavor | q. s. |

to make a solution of not more than 330 cc. The solution should be kept at a temperature of 140° to 160° F. for twenty minutes, filtered hot and immediately bottled, carbonated and sealed. Or the solution may be made at room temperature and the bottles, after being sealed, subjected to a similar temperature.

Solution of Magnesium Citrate thus prepared will remain clear if made *lege artis*, for a long time—it has remained so for two years.

The draft of the medicine itself is made more agreeable to the patient, and the pharmacist has a decidedly more salable product.

The invert sugar was determined by the Iodine method after Willstätter and Schudel, Schmidt, "Organische Chemie," page 1030.

$$C_6H_{12}O_6 + 2I + 3KHO \quad C_6H_{11}KO_7 + 2KI + 2H_2O$$

Potassium Glucosate

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TO DOUBT IS DESIRABLE; NOT TO TRY WOULD BE REPREHENSIBLE.

Every physician should be an investigator. Much of the practice of medicine becomes by reason of its nature, an experiment. The same disease in different individuals causes different reactions, and so treatment needs constant variation, to fit this individuality of our patients. Careful notes of the results of treatment of any sort can be made by any physician; this is investigation. When the accumulated data is studied critically, deductions of very considerable value may be made and important light thrown on therapeutic measures. There remains much that can be studied with very simple apparatus on patients at home as well as in hospitals. In recent years so many complex pieces of apparatus have been devised to record this or that about patients that we are tempted to forget that the physician's five senses and a critical intelligence with very few mechanical aids still are capable of making important advances in medicine. It is well to remember that most of what we have learned in the past in medicine came from such simple methods rather than from the application of complicated apparatus. In the field of methods of treatment there still is need of much investigation. The group of self-limited diseases, as defined by Jacob Bigelow, is a very large one. The fact that scarlet fever rather recently has been removed from this group lends encouragement to the idea that others, too, may be removed by discovering methods for their cure or prevention. Many conditions that now can be ameliorated, may, by reason of investigation, be brought under better control. Many remedies, that we now use, need a better understanding of why and how they work. Many undiscovered remedies probably await the results of trial. Valuable still should be the contributions of students of medicine, who with intelligent skepticism combine thought and knowledge in the study of the many problems that confront practitioners of medicine. An intelligent skepticism assuredly is needed by practitioners now as in years past.—Henry A. Christian, M.D., in the *New England Journal of Medicine*, June 19, 1930.

# DIFFERENCE BETWEEN YUGOSLAVIAN AND AMERICAN DRUG STORES.*

BY ALEXANDER D. TCHALOVSKY.

A Yugoslavian drug store, called "apteka" or "ljekarna," is a place where nothing but drugs are sold. This constitutes the main difference between a Yugoslavian and an American drug store—in this country the drug stores sell many articles of merchandise.

A Yugoslavian drug store is in arrangement and appearance like any other European drug store. There is a large hall in the front of the store, which is the largest and main part of the building. The front of the store has an appearance like that of any American drug store; that is, there are show windows and the main entrance to the store. The hall or large room to which I refer is similar to the front room or large room of any American drug store. In this large room there are cabinets and show cases standing around the walls the same as in an American drug store; the shelves of the show cases are full of suitable containers of characteristic shapes; these hold various pharmaceutical preparations, such as tinctures, ointments, liquors and powders. In suitable drawers there are stored medicinal roots, rhizomes, leaves and flowers; each drawer or shelf bears the name of the respective drug, in Latin; the drugs are arranged alphabetically.

There is one shelf that contains cosmetics, and still another one that contains patent medicines; also there are two cases with all the narcotics—these two cases of potent drugs are kept locked, and are opened only by the registered pharmacist for filling of narcotic prescriptions. The registered pharmacist, the master, is responsible for the use of narcotics. This same rule will apply, I think, to the pharmacist in this country.

On the floor in front of the prescription counter there are a few chairs for the patients. Often the customer is requested to call after a certain time for his medicines, the check system for prescriptions being used, as in American Drug stores.

There are in the large room, standing close to the show window, two office tables, one for the pharmacist—used by him for his personal affairs at leisure times, and the other for doctors who may visit the pharmacy. The doctors, as a rule, have their own offices, but they visit the drug stores very frequently.

The large front room is decorated with statues of Aesculapius, Venus, and some of the ancient Greek and Roman philosophers, such as Aristotle, Plato, Socrates, Virgil and others. Besides statues there are some draperies, pictures and other objects of art, responsive to the æsthetic taste of the master pharmacist.

Next to the large front room is the laboratory (laboratorium). In front of the entrance of the laboratory is a large marble table or counter; on each side of the table, usually, are placed decorative objects, statues or else vases with colored liquids. Each laboratory has one or two analytical balances, a cash register, a recording desk for all prescriptions and a section of pharmaceutical books. The laboratory is well supplied with all chemicals and important apparatus. There

* Section on Commercial Interests, A. PH. A., Baltimore meeting, 1930.

is an especially large work table equipped with all necessary apparatus for the preparation of pharmaceuticals, and another for filling prescriptions.

Close to the laboratory is found the stock room, where drugs and chemicals are kept; also an herbarium for the plant drugs. All the preparations are manufactured by registered men, or one registered pharmacist and two or more assistant pharmacists.

There are in Yugoslavia two state universities where the would-be pharmacists attend classes and are prepared for their careers, but as a rule the pharmacists receive most of their training at foreign colleges. The pharmacist in Yugoslavia is subject to a rigid state examination, and after he passes that examination he is through with such tests. Of course, there are legal regulations concerning the sale of narcotics, for the sale of which the pharmacist is held responsible.

Most of the tinctures and fluidextracts are prepared by the pharmacist; these preparations are rarely imported. All chemicals used in pharmacy are imported from Germany, Great Britain, France, United States and Tchecho-slovakia.

Yugoslavia has a state pharmacopœia, but the English and the French pharmacopœias are used also as standard and reference books.

The doctors usually write their prescriptions in Latin.

The pharmacist treats minor ailments and injuries. In his drug store the pharmacist is the master—he conducts all business transactions, carries on correspondence, orders chemicals, supervises the preparation of all pharmaceutical compounds in the pharmacy and the filling of prescriptions. He is responsible to the public and the municipal authorities for everything that happens in his drug store.

Usually the drug stores are open between 6:00 A.M. and 10:00 P.M. There exists a night service system. This system is arranged by the pharmacists in coöperation with the city government, in order to give night service to the public. A schedule is made with the dates and addresses of all the drug stores in the town. This schedule is arranged to show the nights on which each drug store is to be open in order to give service to the public; it is announced every week through the press.

The doctors of Yugoslavia do not fill prescriptions; they prescribe, but it is the pharmacist who dispenses the medicine. There exists a state pharmaceutical association similar to those in this country.

In conclusion, I would like to repeat the main difference between a Yugoslavian and an American drug store—in a Yugoslavian drug store are sold only medicines and nothing else; whereas, in an American drug store one can buy not only medicines but also many other articles. The American druggist sells many patent medicines, while in Yugoslavia very, very few are sold. The pharmacists, as well as the doctors, in Yugoslavia, oppose the selling of patent medicines. This opposition is, perhaps, due to personal economic interests.

When I came to this country, I wondered why American drug stores sold so large a variety of articles, but upon investigation, I came to the conclusion that in this country there is such intense competition between the drug stores that, consequently, the druggist is obliged to sell many articles of merchandise in order to cover the running expenses of his store and make a fair, reasonable living.

# THE DEPARTMENT OF THE AMERICAN ASSOCIATION OF COLLEGES OF PHARMACY

The teaching of incompatibilities in prescription compounding is of less importance to-day than it was fifty years ago, due to the fact that specifics and active constituents are used more to-day than they were in the past. However, incompatibilities are still prescribed and only recently my attention was called to one of the most incompatible prescriptions I have ever seen. The physician who wrote this prescription had forgotten most, if not all, of his chemistry and the mixture was almost an impossible one. The pharmacist recognizes that it is his duty to overcome these incompatibilities when they occur; therefore the following paper by Dr. Husa will be of interest to all teachers of pharmacy and I believe the average retail druggist will find much of interest in it.—C. B. JORDAN, *Editor.*

## THE TEACHING OF INCOMPATIBILITIES IN PRESCRIPTIONS.*

BY WILLIAM J. HUSA.**

In opening a discussion on the teaching of incompatibilities in prescriptions, it will be well to enumerate some of the principal difficulties which are to be surmounted, and to take stock of the advantages we have that will assist us in the task.

One of the difficulties which immediately suggests itself is the large number of incompatibilities which, conceivably, may occur. Given hundreds of drugs and preparations, an almost inconceivable number of combinations may be made. For example, 500 drugs or preparations will make 257,838,552,475 different combinations, using from one to five items in each combination. It is evident at once that the subject cannot be presented by discussing any appreciable percentage of the incompatibilities that may occur, but that general principles must be enunciated, and practice given in the application of these principles to actual prescriptions.

Another difficulty is that individual opinions differ so widely on how even relatively common incompatibilities should be handled. Whenever incompatibilities are brought up for discussion at pharmaceutical gatherings, and reports made on how certain incompatibilities were overcome, there rarely ever is even the semblance of an agreement among those present as to what should be done. Some say they would do one thing and others say they would do another. Some will recommend certain changes, either with or without the consent of the physician; inevitably, someone will rise to remark that the pharmacist should not make the slightest change without the consent of the physician.

Along with the usual difficulties encountered in attempting to teach anyone to think, reason and develop judgment, rather than to merely memorize and be able to repeat a number of facts, the obstacles mentioned represent the high points in our problem.

An advantage that we have is that, presumably, the students have been well prepared in earlier work. The courses in general chemistry, qualitative and

* Presented before the Pharmacy Laboratory Teachers' Conference, American Association of Colleges of Pharmacy, Baltimore meeting, 1930.

** Professor of Pharmacy, University of Florida.

quantitative analysis, and organic chemistry should prepare the student for the chemical problems that will arise. The courses in botany and pharmacognosy, along with the courses in pharmacy, should give the student an understanding and knowledge of the constituents of crude drugs and preparations thereof. In connection with the courses in theoretical pharmacy, and the manufacture in the laboratory of various preparations, the statement is sometimes made that these courses are not of much value in these days when many pharmacists buy practically all preparations ready made. People who make such statements overlook the fact that it is in these courses that the student becomes familiar with the exact nature and composition of pharmaceuticals, and learns to recognize them by sight and smell, and that the knowledge here obtained as to methods of combining various types of drugs gives the foundation for successful prescription work. The courses in pharmacology lay the foundation for consideration of therapeutic incompatibilities.

The course in prescriptions should therefore be correlated with the previous studies which the student has had. By leading the student to apply the knowledge he already has, the course in prescriptions will be a keystone in the arch of pharmaceutical knowledge. One difficulty here is that our students fail to review sufficiently; their tendency is to promptly forget a course as soon as they have obtained a passing final grade. To minimize this difficulty I encourage the students to review those portions of their previous work which are particularly needed at any given time.

A systematic arrangement of the work on incompatibilities will facilitate the review work and correlation. I have found it best to take up first the incompatibilities of the inorganic compounds and to take these up in the order of the groups which the student learned in qualitative analysis. Thus in beginning the study with silver, lead and mercurous compounds, the student is advised to review the chemistry of these metals and the methods of separation used in qualitative analysis. Later a recitation is held in which applications and correlations are brought out. For example, a question regarding the solubility of chlorides shows how the group separation indicates that the chlorides of these metals are insoluble, while the chlorides of other common metals are soluble. The question may be asked as to which metal appears in both the first and second groups and what the significance of this is, thus bringing out the fact that lead chloride is appreciably soluble. Such points help develop a general knowledge of solubility relations which will be of value in cases of incompatibility due to insolubility, *i. e.*, the so-called pharmaceutical incompatibilities.

Since the cations in each group have certain chemical properties in common, which caused them to fall together in the group separation, they will also be found to have some similar incompatibilities, and this classification is thus a logical one from the standpoint of classifying the study of incompatibilities. Organic compounds may similarly be classified in groups according to the classification the student has had in previous courses.

It is important to have the student carry out a great many laboratory experiments in which he will see for himself the various incompatibilities, and secure practice in methods of overcoming them. In order to avoid confusion in the student's mind, I have classified the work into two parts, *i. e.*, (1) test-tube experi-

ments, and (2) compounding of prescriptions in finished form. Thus test-tube experiments are assigned to show the various incompatibilities, regardless of whether or not they would be dangerous to dispense, while the prescriptions which are compounded, labeled and filed in the student's prescription file cover the cases in which the incompatibility has been modified or overcome so as to be safe to dispense.

The textbooks used in my classes are Scoville's "Art of Compounding" and Ruddiman's "Incompatibilities in Prescriptions." In taking up the incompatibilities of the salts of a certain metal, there is first a review of the chemistry of the metal, followed by test-tube experiments. Since the incompatibilities under each heading in Ruddiman's book are numbered, the assignment for the test-tube experiments may be conveniently given by posting a sheet on which the numbers are listed. The student is required to make a condensed entry in his note book covering each test-tube experiment, which may be in the form of the chemical equation for the change which has taken place, precipitates, color changes, etc., being appropriately indicated. At convenient intervals during each laboratory period each student receives individual attention, his note book and test-tubes being examined and compared. If everything is satisfactory, the test-tubes are then emptied into the sink and the note book is marked as approved.

The emptying of the test-tubes into the sink in the presence of the instructor is an important practical teaching point—there is thus less likelihood of the same tests being submitted for credit by a number of different students. The careful checking of each test-tube by the instructor gives the best check on the quality of the work and the correctness of the results.

The prescriptions which are compounded are taken from such books as the two textbooks already mentioned, "Merck's Manual," etc., and from original sources. After the test-tube experiments of the compounds of a certain element are completed, a number of prescriptions are filled involving the points illustrated. In each case, also, a number of prescriptions are assigned which represent typical prescriptions, such as are compounded every day in the drug store; these usually do not show any incompatibilities. Other prescriptions are assigned which are incompatible as written, but which may be safely dispensed if compounded in a certain way or with some modification. Usually a reference or suggestion is given to aid the student in overcoming or avoiding the incompatibility. In some instances I like to have the student fill such a prescription in two or three ways, in order that he may have definite proof of the alleged improvement, and in order to give him a little of the research spirit.

Following the laboratory work, the ability of the student to apply his knowledge to new prescriptions may be tested and developed by presenting other prescriptions for purposes of recitation and discussion in the class room work.

In regard to the question of what to teach regarding the right of the pharmacist to make changes in prescriptions, there is perhaps some room for application of the well worn phrase that the function of education is to teach the students "how to think, rather than what to think." There should be a discussion of the principles involved, bringing out such points as respect for the intent of the prescriber and consideration of the welfare of the patient, as well as the fact that the well-trained pharmacist is, in general, much better informed than the physician

on methods of combining drugs. Emphasis may be given to the theory that the choice of pharmaceutical details which do not conflict with the intent of the physician should be left to the pharmacist. The student should be encouraged to establish cordial professional relations with physicians and to respect their wishes in regard to whether or not they wish to be consulted about minor improvements in prescriptions.

To summarize, the main points in my system of teaching incompatibilities in prescriptions are as follows: (1) a review of the essential facts and principles learned in previous courses in order to secure maximum benefit from previous work, (2) direct observation of numerous incompatibilities by test-tube experiments, (3) adequate practice in compounding prescriptions so as to overcome or avoid apparent incompatibilities, (4) recitation and discussion emphasizing the principles involved, with mental practice in the application of the principles to other prescriptions.

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## THE CINCHONA TERCENTENARY IN ENGLAND.

The late Dr. E. M. Holmes wrote an article on "Three Hundred Years of Cinchona" for the *Chemist and Druggist* of June 28, 1930. This contribution gave a short account of the discovery and the application of Peruvian bark since its first European use in 1630. In the introductory paragraph he said "a history of the introduction of Peruvian bark into Europe as a febrifuge three hundred years ago is one of the most interesting in the domain of medicine and 1930 forms the appropriate anniversary for recalling the curious facts of the discovery of its properties," etc.

Reference has been made in the JOURNAL to the tercentenary celebration at the Missouri Botanical Gardens, October 31st and November 1st.

The Wellcome Historical Medical Museum in London has a large and interesting collection of material that concerns the history of cinchona. A celebration was held at this museum on December 8th; among the speakers on that occasion were Cardinal Bourne, the Spanish and French ambassadors and the Peruvian Minister. A statement was made by the latter which does not agree with other accounts of the early use of cinchona. He stated that "the second wife of the fourth Count Chinchon, never returned to Spain and that therefore neither she nor the Count's first wife could have been instrumental in the distribution of cinchona in Europe."

Professor Van der Wielen gave an interesting résumé of the early cultivation of cinchona in various parts of the world. Among the exhibits at the Wellcome Museum there are specimens of cinchona bark brought from Peru to Spain in 1777 by Ruiz and Pavon; also, original specimens of quinine and cinchonine prepared by the French pharmacists, Pelletier and Caventou, in 1827. In the exhibit there are also several small gilt-labeled containers from an old Jesuit pharmacy in Granada dating back to the 17th century. Prof. A. Tschirch has contributed a number of interesting specimens, including a lump of cinchona extract in a calabash.

The records contain books and manuscripts of the early history of cinchona. In the list of explorers the name of Dr. Wellcome is given, whose visits to various parts of the world, investigating the sources and possibilities of cinchona, date back to the year 1879. A ledger from Peretti's pharmacy in Rome and old laboratory manuscripts of the Howard's are also included in the collection.

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**Merck & Co.** have issued many interesting pamphlets, recent ones relate to early traditions concerning cinchona bark and its use in malaria and the story of quinine. An interesting display of cinchona products was made at the 300th anniversary celebration of the use of cinchona. A pleasing feature of these notes is that due credit is given to Pelletier and Caventou as *pharmacists*—a comment follows: "Pharmacists have made many such valuable contributions to medical science, while giving time, skill and sympathetic coöperation to the communities they serve."

# PROCEEDINGS OF THE LOCAL BRANCHES

"All papers presented to the Association and Branches shall become the property of the Association with the understanding that they are not to be published in any other publication prior to their publication in those of the Association, except with the consent of the Council." —Part of Chapter VI, Article VI of the By-Laws.

Article III of Chapter VII reads: "The objects and aims of local branches of this Association shall be the same as set forth in ARTICTE I of the Constitution of this body, *and the acts of local branches shall in no way commit or bind this Association, and can only serve as recommendations to it.* And no local branch shall enact any article of Constitution or By-Law to conflict with the Constitution or By-Laws of this Association."

ARTICLE IV of Chapter VII reads: "Each local branch having not less than 50 dues-paid members of the Association, holding not less than six meetings annually with an attendance of not less than 9 members at each meeting, and the proceedings of which shall have been submitted to the JOURNAL for publication, may elect one representative to the House of Delegates."

Reports of the meeting of the Local Branches shall be mailed to the Editor on the day following the meeting, if possible. Minutes should be typewritten with wide spaces between the lines. Care should be taken to give proper names correctly and manuscript should be signed by the reporter.

## CHICAGO.

"About 125 members and friends of the Chicago Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION were entertained by the girls of Gamma Chapter of Lambda Kappa Sigma Sorority on the evening of December 12th at the University of Illinois School of Pharmacy. The president of the chapter, Miss Mildred Schwaba, was introduced by President Hynes and the meeting turned over to her. The girls entertained with instrumental and vocal music, readings, tap dances and a clever play, 'Be a Little Cuckoo.' Following the play the meeting was turned back to President Hynes, who appointed two committees, the Nominating Committee, consisting of Dean Wm. B. Day, as chairman, and Wm. Gray and J. Harry Lindahl to select officers for the coming year, and a committee consisting of Clyde M. Snow and Secretary Martin to draw up resolutions of condolences to be sent to the press and to the family of the late M. A. Miner, one of the few members of the Chicago Branch to become a life member by paying yearly dues. Following these appointments, refreshments were served and dancing was indulged in on the first floor corridor of the main building."

LEWIS E. MARTIN, *Secretary.*

## CINCINNATI.

Dr. R. M. Peale spoke before the December meeting of the Cincinnati Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION on "The Pharmacist and the Doctor." He stated that a doctor should hesitate to prescribe drugs and preparations and designate the brand or manufacturer. The selection of the manufacturer and brand rests with the pharmacist. The layman should be told who are unethical physicians and pharmacists instead of being recommended to a certain one. This permits him to make his own selection which is usually to his satisfaction. It is also the duty of these in both professions to correct false impressions which spring out of nowhere and spread like wild-fire. Where there is evidence of unethical practices, steps should be taken to rid the profession of its leech.

The use of patent medicines should be discouraged, because each case of sickness is individual, while patents are designed to treat the condition as a group. Self-medication has led to thousands of deplorable conditions which might have been avoided with proper medical attention and advice. The physician should hesitate to accept all proprietary medicine with open arms. In doing so he admits an insult in permitting others, often not qualified, to prescribe for him. Prescribing U. S. P. and N. F. preparations will greatly cut down the inventory of the pharmacy and also thwart self-medication because many of these preparations are passed from person to person and used unhesitatingly because of the medical recommendation.

The refilling of prescriptions is another bad practice and should only be done with the consent of the physician. The greatest evil

in both professions is the dispensing physician and the counter-prescribing pharmacist. Neither is qualified to pursue these practices, and both professions would benefit greatly by the elimination of these conditions. The physician is qualified to diagnose and prescribe and the pharmacist has the right to dispense.

The officers for the 1930–1931 session are the following:

*President*, O. E. Kistner; *Vice-President*, Fred. V. Igler; *Secretary*, Chas. F. Henke, Jr.; *Treasurer*, B. J. Kotte; *Trustees:* Frank F. Freericks (1934), Bertha M. Ott (1933), Mortimer Bye (1932), Nicholas J. Blank (1931).

CHAS. F. HENKE, JR., *Secretary.*

## DETROIT.

The December meeting of the Detroit Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION was held Thursday, December 11, 1930, in Y. M. C. A. Building. The dinner preceding was well attended, and a larger number were present when the meeting was called to order at 8:15 P.M. by President Webster. The minutes of the November meeting were read and approved.

Mr. Burniac, chairman of the Membership Committee, reported seven new members for the month. Mr. Webster complimented Mr. Burniac for his efforts in bringing in new members; his number now totals 30 for the year.

President Webster introduced the speaker of the evening, Dr. Robert L. Jones, of the Biological Department of Frederick Stearns & Co., who gave a most interesting and educational talk on "Vitamin Research and Vitamin Study from the Pharmacists' View Point." Dr. Jones said A and D vitamins are successfully assayed biologically; the most active vitamin D at present time is viosterol; the dose for children is 1 to 2 mg. He said the harmful dosage of viosterol has been largely exaggerated and explained that 1000 times the minimum curative dose daily was necessary to produce harmful results. Vitamin A is destroyed by sunlight, but staple under proper conditions. He showed that vitamins A and D prevent certain forms of disease by building up a resistance and vitamin B, most prevalent in yeast and wheat, aids digestion.

Dr. Jones showed many slides illustrating his talk. A vote of thanks was extended to the speaker. On motion of Leonard Seltzer, seconded by J. H. Webster, it was unanimously voted to recommend J. Ed. Richardson to Governor-Elect Wilbur Brucker for re-appointment to the Michigan Board of Pharmacy.

J. H. Webster announced that the next N. A. R. D. Convention is to be held in Detroit, September 28 to October 2, 1931, and asked that the Detroit Branch coöperate with the D. R. D. A. to make this meeting an outstanding one. The motion was seconded by Leo J. LaCroix, and carried by a unanimous vote.

Mr. Seltzer reported the activities of the U. S. P. Revision Committee held in Philadelphia; he said splendid constructive work is being done by the pharmacists and physicians serving on this committee.

BERNARD A. BIALK, *Secretary.*

## NEW YORK.

The December meeting of the New York Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION was held, by invitation of the Kings County Pharmaceutical Association, at their College, the Brooklyn College of Pharmacy of Long Island University, on Monday, the 8th, President Gerstner presiding. There was an attendance of over 120.

President Gerstner thanked the Kings County Pharmaceutical Association, Dean Anderson and the Trustees for their kind invitation to hold the meeting in their very beautiful new building, and congratulated them.

The minutes of the November meeting were read and approved. The treasurer reported on the financial standing of the Branch. A motion was made and carried thanking the treasurer for his report.

Chairman Lehman, of the Committee on Education and Legislation, presented the following resolutions in connection with the Capper-Kelly Bill:

The members of the New York Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION, in meeting assembled at the Brooklyn College of Pharmacy, 600 Lafayette Avenue, Brooklyn, N. Y., on December 8, 1930, have adopted the following resolutions.

"WHEREAS: The bulk of the merchandise offered for sale in the retail pharmacies and drug stores of the United States consists of goods marketed under a trade name or trade-mark, and

"WHEREAS: This condition also exists in most other lines of retail merchandising and

"WHEREAS: Competition has forced the sale of such merchandise at prices which show very little or no profit to the retail merchant, and

"WHEREAS: This method of merchandising is of little or no benefit to the public, as the cost of doing business and the profits must be obtained by asking and obtaining abnormally high prices on unidentified and non-trade-marked merchandise, and

"WHEREAS: This method of merchandising benefits only larger or chain establishments which usually carry a greater proportion of unidentified or non-trademark merchandise, for which the public is deluded into paying an unjustly high profit,

"*Therefore Be It Resolved:* That we the members of the New York Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION declare ourselves in favor of the enactment of the Capper-Kelly Bill (H. R. No. 11, Senate No. 1418) which permits the manufacturers and distributors of trade-marked merchandise to standardize the resale prices, thus ensuring a living profit to the merchants selling such goods and doing away with the temptation of demanding unusually high profits on unidentified and non-trade-marked goods, and *be it further*,

"*Resolved:* That we earnestly pray and request the representatives of the State of New York in the United States Senate and House of Representatives to vote favorably for the adoption of this bill (H. R. No. 11, Senate No. 1418) thereby insuring a square deal to the public, and to the retail merchant, a promise of an existence."

It was voted to adopt these resolutions and to send a copy to each of the members of this Congressional District and to the two Senators of New York State. Mr. Lehman also reported that the New York Pharmaceutical Conference and the Department of Health of the City were planning more satisfactory methods for the handling of hypnotics by physicians and pharmacists.

Dr. Mayer, for the Audit Committee, reported that he had approved of the bills which had been submitted to him.

Dr. Diner, chairman of the Committee on Fraternal Relations, reported progress on the arrangements for the coming joint meeting of the Branch and the Academy of Pharmacy.

The secretary submitted the following names for full membership in the Branch—Professors Lewis N. Brown and Jacob S. Dorfman, Miss Marguerite C. Dimler, and Messrs. Horace T. F. Givens and Rudolph Hauck, also the names of two students for Student Membership; these were approved by the meeting. Applications of Messrs. Edward P. Anzelmi and Domenick Fanelli were read by the secretary for membership in the Parent Organization, and Dr. Mayer reported that he was securing applications from two persons.

The secretary read a letter from Secretary E. F. Kelly in which he asked the Branch to aid in President Christensen's drive for increased membership.

The president appointed a Nominating Committee consisting of Dr. Schaefer as chairman, Mr. Seely and Dr. Mayer, and asked them to bring in a report at the January meeting.

Chairman R. E. Dyer, of the Committee on the Progress of Pharmacy, read abstracts of papers on "Masking the Taste of Bitter Drugs," "A Licorice Substitute," "The Relation of Leafsize and Vitamin A Content of Spinach," "The Relation of Magnesia in the Soil to the Prevention of Cancer," and "A New Formula for Tablets of Acetylsalicylic Acid."

President Gerstner introduced the Hon. William Schroeder, Jr., M.D., chairman of the Sanitary Commission of the city of New York, as the guest speaker of the evening. He told the audience that Dr. Schroeder was a graduate of the Brooklyn College of Pharmacy of 1907, and for this reason it was a distinct pleasure to welcome him there.

Dr. Schroeder introduced his subject "Sanitation Problems of the City of New York" by reminding his hearers that his commission was only appointed a year ago. He stated that, owing to the fact that garbage has been dumped at sea and sewage has been emptying into the rivers and creeks immediately surrounding the city, these waters and even the water at the nearby beaches have had an extremely high bacterial count; sewage has not been taken care of in any modern way. He referred to the cities of Chicago and Milwaukee, where modern disposal plants had been in operation satisfactorily, but these only took care of a small proportion of the cities' waste; the country as a whole had made little advance in solving sanitation problems. The city of New York had paid millions of dollars to ensure for itself a pure water supply, bringing it from great distances, and the

Commissioner said that it was just as important to spend an adequate sum of money for the efficient disposal of the city's sewage and waste. A plant would soon be under construction which would take care of one-tenth of the population; this was to be built on Ward's Island at a cost of $34,000,000. As such a plant requires about 50 acres of ground, if more are to be constructed, an artificial island will have to be made, since sufficient acreage for the purpose is not available in or near the city. Dr. Schroeder said that the Ward's Island plant would use an activated process, which was a bacterial method of disposal; the effluent would be 95% free of bacterial infection before being placed in the stream; it would be as safe to drink this as some drinking waters in country places. The plant would experiment in the making of fertilizer as a by-product. The Commissioner remarked that, though the Health Department waged campaigns against typhoid, diphtheria, etc., yet the city was nullifying much of its work by spreading disease in surrounding waters through the disposal of sewage in them. When the Commission was formed the street-cleaning apparatus was inspected and many pieces were found to be of a great age; these are to be replaced, and in the Spring of 1931 hundreds of covered trucks for the collection of refuse will be seen in the city's streets for the first time. More and more of the city's refuse would be burnt, and at the present time the Borough of Queens was burning 90% of the material collected. Dr. Schroeder, in conclusion, mentioned that his Department was sending out teachers to educate school children on health matters, so that they might teach their parents; he pleaded for the help of pharmacists, as scientific people, to help to make New York a healthy city.

The Commissioner was warmly applauded and President Gerstner thanked him heartily for his address, saying that he was amazed at the interesting facts and figures quoted; he assured Dr. Schroeder that he could rely on the coöperation of the pharmacists of the city in the dissemination of information regarding sanitation.

The meeting was opened for discussion and Drs. Diekman and Diner and Mr. Liberman asked questions to which Dr. Schroeder replied.

The president called upon Dr. William C. Anderson, dean of the Brooklyn College of Pharmacy, as the "host of the evening," to address the meeting on the History of the Kings County Pharmaceutical Society and its College.

Dean Anderson told of the founding of the Society in February 1877 by the retail druggists of Kings County and its incorporation in the following December; since that time, from a few members it had grown to have a roll of over 350. The Society had always been intensely interested in legislation affecting pharmacy; moreover, it had coöperated in the production of the "New York and Brooklyn Formulary" which was the forerunner of the National Formulary of the AMERICAN PHARMACEUTICAL ASSOCIATION. For the past 25 years it had carried on propaganda work to promote the use of U. S. P. and N. F. preparations having, for a period, a special detail man to call upon physicians for this purpose, distributing samples of the official preparations made by members of the Society. At the present time the Society sends out to physicians formulas of seasonable preparations which they may find useful. One of the most important objects of the Society has been the promotion of pharmaceutical education, hence steps were taken early to start a college in Brooklyn and, as a foundation for this, a series of lectures and other instruction in the practice of pharmacy for the drug clerks in the city was first given in 1885.

A charter to enable the Society to establish a college was granted by the State Legislature in 1886, and on October 1, 1891 the Brooklyn College of Pharmacy was opened at 399 Classon Avenue. In May 1892, nine students were graduated with the degree of Ph.G., the graduate to receive the first diploma being the speaker himself. In 1895 the College moved to 329 Franklin Avenue, and in 1903 a move was made to 265–271 Nostrand Avenue, where a building erected by the Society fulfilled all the needs of the College for many years; in 1909 the building was clear of all indebtedness and a celebration was held to burn the mortgage. The largest class the College has ever graduated was that of 1922, which numbered 226 students. The Alumni number over 4300. In September 1929, the College became a Department of Long Island University and in the fall of 1930 moved to its present capacious and well-equipped home at 600 Lafayette Avenue. This is a five-story building, the first floor being used for

administrative offices, library and two lecture rooms, the second devoted to the Department of Pharmacy, including a model drug store, the third to Chemistry and the fourth to Materia Medica. A large gymnasium occupies the fifth floor.

Dean Anderson cited the names of those who had been members of the Faculty and of the Board of Trustees and officers of the Society at various times; many well-known names were recognized. He concluded by inviting all present to partake of the refreshments provided by the Ladies Club in the Library, and thereafter to inspect the building under the guidance of the members of the Faculty and of the Board of Trustees.

The tour of the college was much enjoyed, the last groups leaving the building at midnight.

HERBERT C. KASSNER, *Secretary.*

## PHILADELPHIA.

The December meeting of the Philadelphia Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION was held at the Philadelphia College of Pharmacy and Science on December 9, 1930. President Dunn called the meeting to order and suggested that the regular form of business be dispensed with in favor of the "Symposium on Digitalis." This suggestion met with favor from the members present.

Chairman E. Fullerton Cook presented an outline of what the U. S. P. Revision Committee recognized regarding Digitalis; he said that "the Committee welcomed any aid from all sources in standardizing Digitalis and its preparations." He also stated that "a new form of Digitalis is, however, desirable in the official list; this is a preparation for hypodermic use, and it is hoped that a satisfactory preparation of this character will be developed for inclusion in the U. S. P. XI."

Dr. Githens spoke of the Guinea-Pig Method for standardizing of Digitalis preparations. He showed how well guinea pigs are adapted for this type of work and emphasized the fact that variations in technique did not alter results, as often happens when other animals are employed. A range of accuracy within ten per cent above or below standard strength is possible in using this method. He said that the gold fish method had been suggested by Dr. Pittenger several years ago, but was found unsatisfactory because of the presence of saponins in various drugs which interfered with the gills of the fish and thus furnished unreliable end results.

The next speaker was Dr. Viehoever, who began his discussion and demonstration with a plea for the availability of a fluoroscope in every institution or laboratory where the effects of drug action could be observed from the organic action developed by the administration of a drug directly to the patient or subject. In the absence of a fluoroscope he suggests a test animal like daphnia, which is transparent and whose organic movements may be observed with the microscope. In verification of this statement, daphnia in active health were shown on the screen with the aid of a micro-projection apparatus. The results obtained in exposing daphnia to certain medicinal agents is fairly constant and the hope was expressed that a satisfactory method of standardization might be worked out for assaying Digitalis.

Dr. Munch responded to his share of the program by stating that during the past eight years he had critically reviewed all available literature on Digitalis and had studied at least 1000 representative assays. Out of this number, fourteen chemical methods are available. One of these, the Knudson-Dresbach method, lends itself very readily to the standardization of Strophanthus and is reasonably good for Digitalis, but for safety, a bio-assay is conducted. At least twenty methods using the frog are available, varying only in their method of injecting the preparations into the frog's body. He discussed methods utilizing paramecium, toads, turtles, pigeons, rats, cats and dogs.

From this extensive experience, Dr. Munch finds the One-Hour Frog Method yields results which most accurately approximate results obtained in treating human patients who require treatment with Digitalis preparations. Dr. Munch, as chairman of the A. PH. A. Committee on Physiological Testing, and his associates have prepared two tinctures of Digitalis which are being studied from every angle and which results will be published at a later date.

During the discussion that followed many interesting questions were asked of and answered by the speakers. Dr. John C. Krantz, Jr., who was in the audience, was called upon to add his contribution to the information by discussing the Lupine Method of Standardization.

A mixed audience of more than one hundred

physicians, pharmacists, pharmacologists and students of the allied sciences heard these interesting speakers and their discussions.

Before adjourning, President Dunn announced that the January meeting would be devoted to a mock trial involving a question of general interest to pharmacists.

WILLIAM J. STONEBACK, *Secretary, pro tem.*

## PITTSBURGH.

The first meeting of the Pittsburgh Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION for the school term 1930–1931 was held in the Biological Laboratory of the Pittsburgh College of Pharmacy on the evening of Tuesday, October 21st. The meeting was called to order by the president, John G. Rees. Owing to the absence of Secretary Frank S. McGinnis, the president appointed C. T. Van Meter to act as secretary *pro-tem.*

Prior to the scheduled feature of the evening, H. P. Meldrum, the district passenger agent for the Atlantic Coast Line Railroad Company, discussed the trip from Pittsburgh to Miami, Florida, where the next annual convention of the AMERICAN PHARMACEUTICAL ASSOCIATION will be held. He described the Atlantic Coast Line Railroad, and discussed the contemplated trip along the following points: the probable route, the time of departure and return and the various appealing side trips from Miami. In addition to this he gave historical and other attractive data connected with each of the larger cities *en route*, and he gave approximate estimates of the cost of the trips. At the conclusion of his talk he answered several questions asked by various members. Dr. O'Connell suggested that Mr. Meldrum get in touch with members of the faculty at the end of the school year in order that more definite and accurate information might be available to those who contemplate making the trip. Mr. Meldrum received a hearty vote of thanks.

Dr. Reif then gave an impromptu report on the work done so far on the weed *Galinsoga. The article follows at the end of this Section, hence the references made by the Secretary are omitted here.*

The work on this subject for the present year was outlined; it consists of repeating the biological experiments in an effort to obtain confirmatory results. In addition to this, the Chemistry of the plant is to be studied. The report proved quite fascinating and was received with interest.

Dr. Darbaker showed pictures he had taken during his travels last summer. The trip was made primarily in order to visit several biological institutions in northeastern United States and southeastern Canada, and covered approximately 4700 miles. Before the exhibition of the films, the speaker outlined the complete itinerary. The films were interesting and educational, and portrayed, besides biological institutions and scenery, much small animal life. The various peoples with whom he came in contact on the trip were pictured, together with some of their customs, manner of dress, mode of living and, in some instances, occupational pursuits. Dr. Darbaker's interesting account held the attention of those present.

### NOVEMBER.

The Pittsburgh Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION met November 12th, at the Pittsburgh College of Pharmacy.

President John G. Rees appointed C. T. Van Meter to serve as Secretary. The following Committee on Nominations was appointed: E. C. Reif, A. F. Judd and Louis Saalbach.

The subject of the evening—"An Historical Sketch of Pharmacy" by Dr. Louis Saalbach, was illustrated by lantern slides, after which he directed the round table discussion.

The Branch agreed not to hold a meeting in December.

C. T. VAN METER, *Acting Secretary.*

## WESTERN NEW YORK.

The October meeting of Western New York Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION was planned for Thursday, October 16, 1930, in Foster Hall. This date was selected to bring the meeting during Pharmacy Week, and the feature of the meeting was the Open House celebration of the School of Pharmacy, held to stimulate public interest in Pharmacy during this period. The attendance being so unexpectedly large, no business meeting was held.

The following new members were introduced: James M. Cooke, William Whitehead, R. David Allen.

Mr. Freeman announced the appointment of the following committees:

*Professional Relations:* Dr. Willis G. Gregory, *Chairman;* Dr. Trotter, Dr. Squire.

*Entertainment:* George W. Fiero, *Chairman:* Leon M. Monell and Alexander Kovach, M. C. Swisher.

*Membership:* James M. Cooke, *Chairman;* Robert Davison, Albert Hock, Wilfred J. Bedworth, A. B. Lemon.

*Practical Pharmacy:* R. David Allen, Charles H. Gauger and Karl Smither.

The feature of the evening consisted of four reels of movies, some colored, accompanied by lectures, on the perfume industry of France. These were obtained through the Compagnie Parento, Inc., whose secretary, Addington Doolittle, and chemist, Mr. Picciano, delivered the lectures. The talks and pictures included the following subjects—the collection of the flowers, the preparation of the oils and the manufacture and use of the synthetic perfume materials. L. D. LOCKIE, *Secretary.*

## NORTHWESTERN.

The first joint meeting for 1931 of the Northwestern Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION and the Wulling Club was held in the main lecture room of the College of Pharmacy of the University of Minnesota on Thursday morning, January 8th, with Mr. Rugnar Almin, president of the Branch, in the Chair. More than a hundred attended the meeting, most of whom were students.

The chairman introduced Dean Wulling, who explained briefly the origin and history of the Wulling Club, saying that it had been patterned after the Prescott Club of the University of Michigan, that its membership is made up of undergraduate and graduate students, and that its aims and purposes are to arouse and maintain interest in the highest standards of scientific and professional pharmacy, and that it adopted long ago as its ideal the AMERICAN PHARMACEUTICAL ASSOCIATION and its activities. The aspirations of the Club have always been to be an informal student edition of the AMERICAN PHARMACEUTICAL ASSOCIATION and to carry out as far as students can among themselves, the general principles and purposes expressed in its code of ethics. The Club was organized in 1892 or 1893 and has functioned successfully since with only a few interruptions. The speaker suggested a prospectus of Club activities for the remainder of the year.

The meeting then proceeded to the election of a president of the Club to succeed former President Laska whose term of office had expired. The nominations for the office from the floor included students Gordon W. Wittich, Maynard N. Nelson, Donald B. Sweeney, Lester Hagen. The ballot taken showed Mr. Sweeney to have had the largest number of votes, and the chairman declared him duly elected. Upon motion by Mr. Nelson, who received the next highest number of votes, the election was made unanimous. The next meeting of the Club will be held early in February.

The program that followed was devoted to the discussion of the value of graduate work in pharmacy. The discussion was opened by Prof. C. H. Rogers who emphasized the high place which graduate work in pharmacy has recently earned. He was followed by the three candidates for higher pharmaceutical degrees, Miss Laurine Jack and Mr. Carl Goldner who are candidates for the Master's degree, and Mr. Charles V. Netz who has completed most of the required work for the Ph.D. degree in the science fields of pharmacy. These graduate students stated briefly and interestingly the nature of the research work they are engaged in. This symposium was followed by the reading of a paper by Senior Jerome Lacher on "Many and Diverse Opportunities for Graduates in Pharmacy." The chairman then referred to the many opportunities which graduates in pharmacy have on the road to success. Among the list of unusually successful graduates of the College of Pharmacy of the University of Minnesota he mentioned especially Prof. Marvin Thompson, who graduated in 1926 and who had a phenomenal rise, culminating in October 1930 with the election to a full professorship in the University of Maryland College of Pharmacy.

The meeting was an enthusiastic and interesting one and upon motion to record the meeting in the minutes as a most successful one, the chairman announced adjournment.

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There is a growing certainty that the Capper-Kelly Bill will be called up very soon for debate and final action, hence, opponents are making strong effort to incite opposition by the press and seek to have the Bill amended. There is no reason why the Bill should be amended and at least some of the editorials appearing in the press indicate persuasion of opponents. The splendid efforts put forth by the sponsors and the resolutions, backed up by the organizations, both state and national, should induce every druggist to aid in bringing about final action on this desired legislation and inform the laity relative to the importance of this measure.

# GALINSOGA.*

## A Preliminary Report.

BY EDWARD C. REIF.[1]

Galinsoga, well known to the gardener and farmer as a persistent weed, is an annual, exceedingly common in Pennsylvania. It grows wild in settled regions, truck gardens and vacant lots. It is seldom found growing in wooded areas. The presence of this weed in the region of the State College was first reported in 1887 by Prof. J. P. Kelly. A specimen in the herbarium at State College of Pennsylvania was collected at Pittsburgh by Thomas C. Porter in 1869.

The United States Department of Agriculture reports that Galinsoga is widely distributed in this country. The Iowa State College of Agriculture reports that it has been introduced as a weed at Osage, Iowa, (Mrs. F. May Tuttle), at Strawberry Point, Forest City, Montrose and McGregor, Iowa. They also report having specimens from New York, Virginia, Pennsylvania, Missouri, Michigan, Ohio, Wisconsin, and also from Mexico. The weed is known locally as Pittsburgh Weed and has been classified by Dr. Otto E. Jennings of the Department of Botany of the University of Pittsburgh as *Galinsoga parviflora*. He states—"it is a weed which is adventive from Porto Rico."

The genus *Galinsoga* is described in "Gray's Manual:" Several-flowered heads, radiate; rays 4–5 small, roundish, pistillate. Involucre of 4–5 ovate thin bracts. Receptacle conical with narrow chaff. Pappus of small, oblong, cut fringed, chaffy scales; sometimes wanting. Annual herbs, with opposite triple-nerved thin leaves and small heads; disk yellow; rays white or reddish. The species *parviflora:* pubescence subappressed; leaves ovate, crenate-serrate, petioled; pappus of the disc flowers of spatulate obtusish scales, and equaling the akenes. Rays white.

The species *Caracasana:* pubescence loose and rather copious; leaves as in the genus *parviflora;* rays reddish; pappus of the disc flowers about half as long as the akenes. This has been reported from the wastes of New Jersey (Camden) and the mill district of Cumberland, Maryland.

The weed has been widely used by the farmer in this region as a remedy for ivy poisoning by applying the freshly crushed plant to the affected areas. The United States Department of Agriculture reports that it has been used in the treatment of wounds.

As a preliminary to the pharmacological study of the weed three fluidextracts were prepared according to the type process A of the U. S. P. X. The material selected consisted of the carefully dried, above-ground parts of the flowering plant, in which, all stems over 3 mm. in diameter were rejected. In the preparation of these fluidextracts, alcohol of varying strength was used as the menstruum, namely, twenty-five (25), fifty (50), and seventy-five (75) per cent. These fluidextracts were stored for one month, after which they were filtered and analyzed for alcohol content and extractive yield. The results upon analysis are shown in the following table:

| Menstruum used, alcohol per cent. | Finished product, alcohol per cent. | Extractive yield Gm. per 100 cc. |
|---|---|---|
| 25 | 20.035 | 22.22 |
| 50 | 47.995 | 16.02 |
| 75 | 69.11 | 16.92 |

The fluidextract made with 50% alcohol as the menstruum was used in the experiments upon the turtle, frog and guinea pig. The other two were used in the experiments upon the frog.

A distinct disturbance in the rhythm of the auricular and ventricular contractions was noted when the isolated heart of the turtle was bathed with a 2% dilution of a fluidextract in saline solution. This experiment was repeated a number of times, using each time a different turtle heart.

Doses of 0.006 cc. of the fluidextract per Gm. body-weight, when injected subcutaneously, cause death in guinea pigs in 24 hours. The following observations were noted: severe sneezing and diarrhoea; severe twitching of the jaws; eye balls were ejected and covered with mucus;

* Read before Pittsburgh Branch, A. PH. A.

[1] School of Pharmacy, University of Pittsburgh.

the respirations at first were very rapid, becoming slow and shallow just before death; paralysis of the hind limbs. The fluidextract used in this experiment was evaporated to one-third of its volume, diluted to the original volume and filtered.

Doses of 0.006 cc. of the fluidextract per Gm. body-weight, when injected into the ventral lymph sac of the frog, cause a marked disturbance in the rhythm of the auricular and ventricular contractions. The number of auricular contractions were far in excess of the number of ventricular contractions. The auricles upon examination were found to be well distended and filled with blood, whereas the ventricles were usually found to be empty. The method of assay as recommended for *Digatalis* U. S. P. X was followed. Before making the observations upon the heart, the animals were pithed in the usual manner, one hour after injection. The fluidextract used for injection was modified as outlined in the previous experiment.

The results of the previous experiments seemed to indicate that a better picture of the action of the weed could be obtained by making observations upon larger animals. The effect upon the respiratory and circulatory systems could be noted and studied, especially the blood pressure and circulatory curves. Accordingly studies upon the dog were undertaken. The set-up chosen for the blood pressure tracings was the one usually selected to record such studies. The respiratory tracings were made in the usual manner with the aid of a pneumograph and tambour. After the tracings of the normal pressure of the dog were made, injections of the fluidextract prepared with a 75% alcoholic menstruum were made into the saphenous vein. A control injection of the menstruum was made between each injection of the fluidextract to obviate any error from this source. Injections were made at 8-minute intervals. Three injections of the fluidextract in 1-cc. quantities and three injections of the menstruum of the same quantity were given. The following results were noted: The control injections caused no change in the blood-pressure curve, or increase in the respiratory rate. However, within 35 seconds after the injection of the fluidextract, a distinct rise in blood pressure was noted. The rise at its maximum reaching a point averaging 14 mm. of mercury above the normal. The pressure returned to normal within two minutes and remained normal. The respiratory rate showed a progressive increase indicating that the effect of the preparation upon the respiratory rate was more prolonged than the effect upon the blood pressure. The normal respiratory rate over equal periods of time was found to be 22, after first injection the rate rose to 27, and after the second to 30, and after the last to 35.

A record of the effects of the fluidextract made with a 25% alcoholic menstruum was next sought. The set-up and the site of injection was the same as in the previous experiment. Control injections of the menstruum were also made between the injections of the fluidextract. The results were recorded as follows: The injections of the control menstruum caused no change in the blood-pressure curve, or respiratory rate. However, the injection of 2 cc. of the fluidextract produced a maximum fall in the blood pressure of 25 mm. of mercury in one minute. Three injections of 2-cc. quantities were made at eight-minute intervals and each injection caused a fall in blood pressure. It was noted, however, that in no instance did the blood pressure return to its normal level. Upon returning to the range of the normal pressure, it was noted that the pressure was from 3 to 5 mm. below the pressure prior to the injection of the fluidextract. The respiratory rate also underwent certain changes. From a normal of 37, the rate was increased to 47 after the first injection, to 66 after the second, and to 106 after the third and last injection.

The anesthetic chosen was morphine sulphate hypodermically in doses of 10 mg. per Kg. body-weight followed in $1^1/_2$ hours by the injection of chloretone dissolved in olive oil, intraperitoneally, in doses of 225 mg. per Kg. body-weight.

## CONCLUSIONS.

1. A saline dilution of the fluidextract of *Galinsoga*, when applied to the isolated heart of the turtle, causes a marked disturbance in the rhythm of the auricular and ventricular contractions.

2. Doses of 0.006 cc. of the fluidextract per Gm. body-weight, when injected into the ventral lymph sac of the frog, cause a disturbance in the auricular and ventricular contractions and a marked slowing of the ventricles.

3. Doses of 0.006 cc. per Gm. body-weight, when injected subcutaneously, cause death of guinea pigs in 24 hours.

4. Doses of 0.000067 cc. of the fluidextract made with 75% alcohol as the menstruum cause a rise in blood pressure of dogs when injected intravenously.

5. Doses of 0.000134 cc. of the fluidextract made with 25% alcohol as the menstruum cause a fall in the blood pressure of dogs when injected intravenously.

6. The possible presence of a principle or principles causing a rise in blood pressure is indicated in the fluidextract made with 75% alcohol as the menstruum.

7. The possible presence of a principle or principles causing a fall in blood pressure is indicated in the fluidextract made with 25% alcohol as the menstruum.

8. The possible presence of a principle or principles causing an increase in the rate of respiration and apparently cumulative in action is indicated in both fluidextracts.

The writer believes that these results justify a continuation of the research, and results will be reported from time to time in THIS JOURNAL. He also wishes to express his appreciation of the very able assistance and coöperation of his co-workers Messrs. Howard Dolyak, Milo Evosevic and John A. MacCartney.

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# COMMITTEE REPORTS

## REPORT OF THE COMMITTEE ON PATENTS AND TRADEMARKS, 1930.

BY F. E. STEWART, *Chairman*.

The late Charles E. d'M. Sajous, M.D., of honored memory, in the introduction of his work on *The Internal Secretions and the Principles of Medicine*, called attention to a most important subject worthy of our thoughful consideration. He said:

> "At the dawn of the present century, one of our foremost clinicians, Llwellys Barker, of Johns Hopkins, wrote that therapeutics is moribund; eight years later, our foremost pharmacologist, Sollmann, wrote at present it cannot be classed as an art nor as a science; it can only be classed as a confusion. To-day therapeutics has been virtually eliminated from the curricula of our largest medical schools. What this means does not seem to have been apprehended by those upon whom rest the responsibility of deciding such questions. They overlook the fact that by allowing therapeutics to disappear from the list of subjects taught, *they are insuring the doom of medicine itself*. Indeed, even empirical therapeutics, that of the day, is at least based upon vast experience and observation, and affords material relief in suffering and often saves life. Virtually deprived of this knowledge by medical schools, graduates of the future will increasingly realize that their livelihood will no longer be earned honestly, unable as they will find themselves to meet the needs of those, granting them unmerited confidence, who will appeal to them for aid. Honorable men will increasingly abandon a career so little in keeping with their true aims, leaving the field open to the unscrupulous, the Christian Scientists and cults of all kinds. The phenominal development of such in recent years emphasizes already what the future has in store, if legitimate therapeutics is allowed to die."

Dr. Sajous spoke truly. The field of therapeutics, especially drug therapeutics, has been increasingly abandoned by the medical profession. Physicians have increasingly entered the field of non-drug specialties, leaving the field to be cultivated by the commercial drug business and the nostrum manufacturers. So diligently has the field been cultivated by the latter that the legitimate interests of the manufacturers engaged in the pharmacal and pharmaco-chemical industries, as well as the United States Pharmacopœia, the profession of pharmacy, and the schools and colleges of pharmacy, are threatened with extinction.

Referring to the nostrum business, Professor Charles H. LaWall, dean of the Philadelphia College of Pharmacy and Science, in his classic work, "Four Thousand Years of Pharmacy," says:

> "Secrecy, mystery and superstition have been the indispensable ingredients of many successful prescriptions and remedies from the time of the earliest Egyptians down to and including the present. The evolution of the nostrum, that

blot upon scientific medicine and pharmacy, for which professions are jointly responsible, is a separate story altogether. From these mysterious polypharmacal monstrosities, evolved by the physicians of the seventeenth and eighteenth centuries and used by them as secret remedies, has developed the modern nostrum traffic, a veritable Frankinstine taking toll in the United States alone of more than $200,000,000 annually, or enough to endow pharmaceutical and medical education and research for the permanent benefit of mankind."

The gradual abandonment of the therapeutic field by the medical profession threatens the future of the medical and pharmaceutical journals with loss of patronage, and the only way to save it seems to be in teaching physicians pharmaco-therapy in the reading pages of the medical journals. However, it stands to reason that the medical journals cannot afford to open their reading pages to teaching physicians how to employ the advertised materia medica as therapeutic agents. As stated by Prof. Wm. H. Thompson, M.D., L.L.D., who, in his day was an eminent leader of the medical profession, "The verdict about any alleged remedy must depend upon the findings of a jury whose members should not only be competent, but also so numerous and of such difference in locality and nationality that all personal or local influences can be safely left out of account."

It is evident that such an investigation of therapeutic agents commercially controlled and undergoing introduction to the profession in the advertising pages of the medical journals is impractical. Favorable reports would be appropriated by the commercial introducers for advertising purposes. The publication of unfavorable reports in medical journals would meet with reprisal including loss of advertising patronage, and, perhaps, lawsuits for damages.

### ACTION OF THE AMERICAN THERAPEUTIC SOCIETY.

The American Therapeutic Society was organized in 1900, during the meeting of the National Pharmacopœial Convention at Washington, to promote progress in therapeutics and stem the tide of rapidly growing therapeutic nihilism in regard to drugs as therapeutic agents. Among the causes of this loss of faith in drugs were several of importance, including the growth of non-drug specialties, the "new remedy business" and the misleading advertising of the commercial introducers.

It was found that the misinterpretation and misapplication of the patent and trademark laws by the manufacturers of medicine and by the lower courts had also much to do with it. However, the decisions of the Supreme Court of the United States often over-ruled the decisions favorable to the nostrum trade except those dealing with product-patents.

### PREAMBLE AND RESOLUTIONS ADOPTED BY THE AMERICAN THERAPEUTIC SOCIETY MAY 1, 1922.

"WHEREAS, the exact therapeutic value of new and even old drugs cannot be demonstrated owing to (1) the variety of names under which they are marketed; (2) the variation in their character, quality and strength due to different processes of manufacture; (3) the opprobrium of publishing in medical journals laudatory articles advertising commercially controlled drugs; (4) the fact that medical journals are unwilling to publish articles repudiating the therapeutic value of drugs, the advertisements of which are carried by them in their advertising columns.

"WHEREAS, the large majority of practitioners of medicine and surgery find it impossible to remember or to take time to write the long chemical names of drugs, which have short, easily remembered names claimed as trademarks by their manufacturers.

"WHEREAS, the constant use of a commercial name by physicians in prescribing and pharmacists in ordering supplies creates unfair monopolies in the sale of such drugs, to the discouragement of other manufacturers of the same products under their chemical names and hence by destroying competition, removes the incentive to excel in the production of preparations of superior quality, therefore, be it

"1. *Resolved*, that the American Therapeutic Society herewith records its complete disapproval of all methods now in vogue for obtaining monopolies of drugs, vaccines and serums by product-patents and the registration of so-called commercial names as trademarks, and be it

"2. *Resolved*, that the American Therapeutic Society herewith records its approval of, and will support, measures that aim toward the patenting of processes and apparatus for the

manufacture of medicinal drugs, chemicals and preparations of the same when such preparations are in fact new and useful inventions, provided that a complete description of their chemical composition, method of preparation and standardization and tests for purity are made known in the application for patent in such clear and concise language that any chemical or pharmaceutical firm may manufacture and market said drugs, and

"3. *Resolved*, that the American Therapeutic Society approves the patenting of new drugs under agreement whereby the educational, research and eleemosynary institutions are licensed by the patentees or their agents or assigns to produce such patented products without royalty, and be it

"4. *Resolved*, that the American Therapeutic Society also approves measures whereby the owners of such patents shall license the production of such patented products to completing manufacturers on a royalty basis, and

"5. *Resolved*, that the American Therapeutic Society urges the coöperation of the medical profession, pharmacists, pharmaceutical firms, manufacturers of drugs and editors of medical and pharmaceutical journals toward the end of appointing committees with power to promote such legislation as is needed to abolish the obnoxious and unscientific production, marketing, and use of drugs patented under the present laws, be it also

"6. *Resolved*, that a copy of these resolutions be sent to the secretary of each national medical and pharmaceutical association and to *The Journal of the American Medical Association*."

PRODUCTS-PATENTS *vs.* PROCESS-PATENTS.

J. W. England, well-known pharmacist, prominent member of the Pennsylvania Pharmaceutical Association and its ex-president and a leader of the AMERICAN PHARMACEUTICAL ASSOCIATION, with long experience as director of the chemical laboratory of a large manufacturing and wholesale drug house, therefore in position to speak with authority on the subject, is in agreement with the American Therapeutic Society on the subject of product-patents. He says in the JOURNAL of the AMERICAN PHARMACEUTICAL ASSOCIATION, Vol. 6, No. 2, under the head "The Product-Protection of Chemical Compounds:"

> "The crux of the situation in relation to the patent-protection of chemical compounds, more particular the synthetics, in this country, is to be found in the system of product-protection. We permit the first inventor to patent the product *as such* and thereby we stop all future inventors from marketing the same product no matter how made. It is hardly necessary to cite examples of the thousands of synthetic compounds made in Germany and process-patented and product-patented in this country, but for illustration, we shall call one of these 'X,' and it is a widely used compound. Prior to the European conflict 'X' sold in this country for about forty or fifty cents an ounce (wholesale) while the price in London was equivalent to about 8 to 10 cents an ounce * * * * 'X' cannot be marketed and sold in this country except by the owners of the patent, who have product-patented the compound, even if it be made by an entirely new and original process of manufacture. * * * And as these owners alone have the monopoly of sale they can fix the selling price. But in Germany product-patents are not allowed, and 'X' can be made by any other process than that used originally for making it, and can be marketed. * * * I blame the American public for not demanding a revision of the patent laws insofar, at least, as relates to the product-protection of chemical compounds, because the law prevents the growth and development of an American industry."

The German patent law excepts from patent protection: (1) inventions the application of which is contrary to the laws or public morals; (2) inventions relating to articles of food, whether for nourishment or enjoyment, and medicines, as also substances prepared by chemical processes insofar as the inventions do not relate to a definite process for the preparation thereof.

Patents are granted, however, for processes and apparatus for manufacture, and Section 35 provides a method for protection of inventors of processes for the production of new substances in the following manner: If the invention relates to the production of a new substance, all substances of like nature are considered as having been made by the patented process until proof to the contrary is given. (See Report of the Commission Appointed to Revise the Patent and Trademark Laws, etc., under Act of Congress Approved June 4, 1898. Senate Document No. 20.)

THE REGISTRATION OF COMMERCIAL NAMES IN THE PATENT OFFICE AT WASHINGTON AS TRADEMARKS.

The American Therapeutic Society records its complete disapproval of the registration of so-called commercial names as trademarks as a method of obtaining monopolies of drugs. Its reasons as cited in its Preamble and Resolutions are pertinent, but the subject has even more important bearings upon our subject than here given.

It has been several times pointed out in the reports of the committee on Patents and Trademarks of the AMERICAN PHARMACEUTICAL ASSOCIATION that copy rights and patent rights are creatures of statute and of grants and subject to the conditions incorporated in the statutes and in the grants, while, on the contrary, trademark rights are creatures of natural right and common law. This distinction between copy rights and patent rights on the one hand and trademark rights on the other is basic and very important to understand.

> "If to-day you should invent an art, a process, or a machine, you have no right at common law, nor any natural right, to hold that for seven, ten, fourteen, or any given number of years, against one who should invent it to-morrow, without any knowledge of your invention, and thus cut me and everybody else off from the right to do to-morrow what you have done to-day. There is no absolute or common law right, that I, being the origina land first inventor to-day, have to prevent you and everybody else from inventing and using to-morrow or next day the same thing. (A. M. H. & L. Mach. Co. *vs.* Am. Tool & Mach. Co. Fisher's Patent Cases, 294.)
>
> "The theory upon which the copyright and patent rest laws is that it is to the interest of the community that persons should be induced to devote their time, energies and resources to original investigation for the furtherance of science, the arts and manufactures. This was recognized from the earliest times which can pretend to be described as civilized. It is to the advantage of the whole community that authors and inventors should be rewarded, and no measure of reward can be conceived more just and equitable and bearing a closer relation to the benefit conferred by the particular individual than to grant him the sole right to his writing or discovery for a limited period of time." (Terril, in his treatise on Patent Law.)

Starting from the premise that authors and inventors do not possess a natural, or common law right to the exclusive use of their respective writings or discoveries—that civilization is dependent upon invention, discovery and imitation and duplication of inventions and discoveries and their improvement from age to age; also the recording of such, and the reduction of the knowledge thus evolved to law, and embodying it in system, and protecting this knowledge from pretense and error by fixed and changeless nomenclature, thus creating *science*, the framers of the Constitution of the United States incorporated a clause giving Congress the power. "To promote the progress of science and useful arts, by securing for limited times to authors and inventors, the exclusive right to their respective writings and discoveries. (See Clause 8, of Sec. VIII Article I.)

THE UNITED STATES COPY RIGHT PATENT, AND TRADEMARK LAWS AND THEIR INTERPRETATION AND APPLICATION BY THE COURTS.

As just stated, the copy right and patent laws rest upon Article I, Section VIII, Clause 8, of the Constitution of the United States. The Constitution does not specifically provide a clause upon which to rest the trademark laws. Section 8, Clause 3, however, gives Congress the power "To regulate commerce with foreign nations, and among the several States and with the Indian tribes." On this clause the trademark laws are pinned. It will be noted that Congress is not granted power to grant copy rights or patents on names, either in this or any other clause of the Constitution. As stated by ex-commissioner of patents, Newton, "the trademark law is not a law for *creating* trademarks; it is a law for *registering* trademarks."

Copyright and patent rights are granted to authors and inventors, respectively, as rewards for benefits conferred upon the public. They are granted for limited times only. When the grants expire authors and inventors no longer enjoy their protection. As we have already seen, the right to copy published writings and published inventions are public rights. The writer of a book, pamphlet and other writings, as long as the writer has them "under lock and key," "is protected by law from unauthorized publication by others. But common law, while thus

guarding from invasion on an author's well-defined property rights in the form or style of his composition, ceases to protect an author once his works are made public." (The New Universities Encyclopedia.) An inventor, as long as he keeps his invention hidden, has its manufacture and sale under control. But the common law does not protect him from invasion when he exposes his invention to the public eye. Any person has the right to copy it and offer copies for sale. Hence the necessity of copy right and patent laws for the protection of writers, publishers, inventors and manufacturers of inventions as articles of commerce.

Trademark rights are not grants. Manufacturers and merchants have a natural right to so label or mark their goods as to identify their *make* or *brand* of the same. This is a natural right just as much so as the right possessed by every person to sign his own name to a check, deed, contract or any other document requiring his signature. Moreover, this right does not expire. It is a perpetual right as long as the individual possessing it lives. In fact, a trademark is often referred to as a "commercial signature."

But the name of the goods cannot be a trademark on the goods to which the name is affixed. As stated by the learned judge in the case of Leclanche Battery Co. *vs.* Western Electric Co. (83 Fed. rep.) "When an article is made that was theretofore unknown, it must be christened with a name by which it may be known and dealt in, and the name thus given it becomes public property, and all who deal in the article have the right to designate it by the name by which alone it is recognisable."

*Can a Name Become a Trademark?* Yes. A name can become a trademark by use as a trademark; but it cannot become a trademark if used as the name of the goods or as a synonym thereof. To become a trademark the name must be used *fancifully*. For example, the name "Eagle" is used as a trademark on a brand of condensed milk. The name "Eagle" used alone, means eagle, it cannot possibly mean condensed milk. In other words, it cannot possibly describe the contents of the can of condensed milk as a synonym. It is used *fancifully*, not descriptively. Therefore, when a customer goes to his grocery store to purchase a can of condensed milk, and the grocer who carries several brands in stock, asks the customer what brand he wants, the word "Eagle" used by the producer enables the purchaser to reply, "I want the "Eagle brand."

"In short, a trademark denotes the *producer* and *not the thing produced*. ("The New Universities Encyclopedia.")

### BASIC TRADEMARK DECISION BY THE SUPREME COURT OF THE UNITED STATES.

The first national trademark law was enacted by Congress in 1870. It was pronounced unconstitutional by the Supreme Court. The basic decision was that of Delaware and Hudson Canal Company *vs.* Clark. In referring to this decision the Official Gazette of the U. S. Patent Office (1872, page 28) said:

> "The Supreme Court of the United States in President, etc., of the Delaware and Hudson Canal Company *vs.* Clark, repeated a proposition that as a rule has been frequently enunciated and settled beyond question, *viz.:* The office of a trademark is to point out distinctively the origin or ownership of the article to which it is affixed or, in other words, to give notice who was the producer." The Court went on to say: "No one can claim protection for the exclusive use of a trademark or trade name which would practically give him a monopoly in the sale of any goods other than those produced or made by himself. If he could, the public would be injured rather than protected, for competition would be destroyed. Nor can a generic name or a name merely descriptive of an article of trade, or of its qualities, ingredients, or characteristics, be employed as a trademark, and the exclusive use of it entitled to protection. (Canal Co. *vs.* Clark, 13 Wall, 323.)

### WHY, IN THE LIGHT OF THIS DECISION, DOES THE UNITED STATES PATENT OFFICE PERMIT THE REGISTRATION OF THE NAMES OF ARTICLES OF TRADE AS TRADEMARKS?

The United States Patent Office *does not* permit the registering of articles of trade as trademarks. Indeed the trademark law specifically forbids it. The law states "That no mark which consists merely in the name of an individual, firm, corporation, or association not written, printed, impressed or woven in some particular or distinctive manner * * * or merely in words or devices

which are descriptive of the goods with which they are used, or of the character or quality of such goods * * * shall be registered under the terms of this Act." The name of a medicine, for example, when included in some "particular or distinctive manner" within a design or drawing of some kind, becomes part of a trademark. But the name, separated from the design, is not in itself a trademark; but is simply the name of the medicine which any person has the right to use as the name of the article which it describes.

### OPINION OF THE HOUSE COMMITTEE ON PATENTS RELATIVE TO TRADEMARKS.

The following statement was made by the Hon. Benjamin Butterworth speaking as the Chairman of the House Committee on Patents of the U. S. Congress:

"While the House Committee on Patents is not an interpreter of law, that being the function of the Supreme Court of the United States, the Committee in its individual capacity is of the following opinion:

"1. The registration of a trademark does not make it valid. Registration is merely giving notice that the thing registered is claimed as a trademark. The validity of the claim can only be settled by the courts.

"2. The use of a trademark in no way restricts the free use of others of the articles of merchandise to which it is affixed. It confers on the user no privilege to the exclusive use of an invention of the kind conferred by the patent law. Otherwise we should have an anomoly of laws directly opposing one another. The patent law grants the inventor exclusive right to his invention for a limited time, and then only on the publication of full knowledge of the invention whereby the public may manufacture it when the patent expires. The use of a trademark, on the contrary, is unlimited in duration, and no publication is required when it is used on an invention.

"3. The public has a perfect right to manufacture and sell any article of commerce not patented, and do so under its proper or generic name, whether a trademark is used in connection with the article or not. For this reason the courts hold that names describing the articles cannot be used as trademarks on the articles they describe. Otherwise trademarks would be a hinderance to competition, while the proper use of a trade-mark promotes competition by distinguishing between one brand of an article and another brand of the same article, thus stimulating manufacturers to improvements in processes and methods of manufacture for the purpose of excelling each other in producing the same article of better quality or lower price."

### THE STATUS OF SECRET PROPRIETARY MEDICINES.

The following is abstracted from the Law Encyclopedia, Vol. XXXVIII:

"The name of a secret or proprietary medicine is descriptive thereof, and hence not a valid trademark. Anyone who discovers the secret and makes the goods according to the formula may use the name to describe the goods. * * * Of course the name may not be used to pass off spurious concoctions as and for the genuine preparations (page 740). A subsequent user of the same must add some distinguishing statement showing the article is his own production of the article known by that name in addition to using the name and he must not imitate the dress or the make up of the goods, or do any affirmative act calculated to deceive the public and pass off the goods as and for the previously known goods (pages 38–385)."

### SOME REQUIREMENTS OF THE UNITED STATES PATENT LAWS.

According to the United States Patent Law an invention to be patentable must conform to the following requirements: It must be—

1. New and useful.
2. Previously unknown or used by others in this country.
3. Must not have been patented or described in any printed publication in this or any foreign country before the inventor's application for patent in this country.
4. Must not have been in public use or on sale for more than two years prior to the application for patent; unless the same is proved to have been abandoned.
5. The application for patent must be in writing to the Commissioner of Patents.
6. Said application must contain a written description of the invention, and of the manner of making, constructing, compounding and using it, in such full, clear, concise and exact terms,

as to enable any person skilled in the art or science to which it appertains, or with which it is most closely connected, to make, construct and use the same.

7. In case of a machine, the inventor shall explain the principle thereof, and the best mode in which he has contemplated applying that principle, so as to distinguish it from other inventions.

8. The inventor of the machine shall particularly point out and distinctly claim the part, improvement or combination, which he claims as his invention or discovery.

9. The said specifications and claim shall be signed by the inventor and attested by two witnesses.

10. When the invention or discovery is of a composition of matter, the applicant, if required by the Commissioner, shall furnish specimens of the ingredients and of the composition, sufficient in quantity for the purpose of experiment.

11. *Every patent shall contain a short title or description of the invention or discovery, correctly indicating its nature and design.*

12. Every patent shall contain a grant to the patentee, his heirs or assigns, for the term of 17 years, of the exclusive right to make, use and vend the invention or discovery throughout the United States and Territories thereof, referring to the specification for the particulars thereof.

13. A copy of the specifications and drawings shall be annexed to the patent and be a part thereof.

THE STATUS OF PATENTED INVENTIONS WHEN PATENTS HAVE EXPIRED.

The following statement constitutes the decision of the Supreme Court of the United States in the Singer Sewing Machine Case in 1895:

> "The result, then, of the American, the English and the French doctrine universally upheld is this, that where during the life of a monopoly created by a patent a name, whether it be arbitrary or that of the inventor, has become, by his consent, either express or tacit, the identifying and generic name of the thing patented, this name passes to the public with the cessation of the monopoly which the patent created. Where another avails himself of this public dedication to make the machine and use the generic designation, he can do so in all forms, with the fullest liberty, by affixing such name to the machine, by referring to it in advertisements, and by other means, subject, however, to the condition that the name must be accompanied with such indications that the thing manufactured is the work of the one making it as will unmistakedly inform the public of the fact."

COMPLAINTS THAT THE PATENT OFFICE IS NOT PROPERLY PERFORMING ITS FUNCTIONS.

The chairman of your Committee has received several requests for the Committee to make known certain complaints in regard to the Patent Office not properly performing its functions, due, probably, to overwork.

The contention that the Patent Office has more to do than its facilities permit receives support from the address of the Hon. Charles Merrill Hought given at the dinner of the New York Patent Law Association, Feb. 10, 1927. He said: "According to an annual report now widely and proudly published there were 1,612,789 grants of monopoly since 1836, and of late over 45,000 in a single year. Allowing 300 working days to the year, 150 per day, and all depending upon one statute. Now, as the British cross-examiner says 'I put it up to you,' can anybody have any collective respect for 45,000 patents a year?"

Add to this enormous work that required to register thousands of so-called trademarks annually, and it is not surprising that the market is overloaded with nostrums, patented and unpatented, to the serious injury to the public health.

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## NATIONAL ASSOCIATION OF RETAIL DRUGGISTS TO MEET IN DETROIT.

The thirty-third annual convention of the National Association of Retail Druggists will be held in Detroit, September 28 to October 3, 1931—the Book-Cadillac has been selected as headquarters hotel.

# ASSOCIATION BUSINESS

THE COUNCIL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION, 1930–1931.

Office of the Secretary, 10 West Chase St., Baltimore, Md.

LETTER NO. 6.

December 18, 1930.

*To the Members of the Council:*

*63. Use of the Text of the N. F. V. Motion No. 17* (see Council Letter No. 5, page 1343) has been carried and the companies mentioned have been so advised.

*64. Committee on Unofficial Standards. Motion No. 18* (see Council Letter No. 5, page 1343) has been carried and Drs. Rusby and Ziefle have been advised. Dr. Ziefle has accepted election as a member of this Committee.

*65. N. Y. Branch, A. Ph. A., Resolution of Mr. H. W. Ambruster.* (See Council Letter No. 5, page 1344.) The following comment has been submitted by S. L. Hilton: "As this is a government matter and the Senate committee has not made a report I cannot see that any discussion or action can be taken."

*66. Publication of Supplements to the N. F.* (See Council Letters No. 2, page 922; No. 3, page 1024; No. 4, page 1150; and No. 5, page 1343.) As no further comments have been received and as no objection has been raised, the matter of supplements is laid on the table and is made a special order of business at the second meeting of the Council in Miami, in July 1931.

*67. Election of Members. Motions No. 19 and No. 20* (see Council Letter No. 5, page 1345) have been carried and applicants numbered 66 to 109, inclusive, and H-16 are declared elected.

*68. Budget for 1931.* The Committee on Finance, through its chairman, presents to the Council the following list of appropriations to cover the various expenditures of the ensuing fiscal year, in accordance with Article II of Chapter II of the By-Laws of the Council, partly based upon estimates from the secretary and suggestions from members of the Committee on Finance, with the following comments:

"Many of the items in this budget are of a routine character, and most of them should be changed only when new conditions call for a change.

"There is one substantial change in this budget, namely, the proposed appropriation for the Headquarters Building Campaign, which is reduced from $4000 to $2000, considered to be sufficient for this purpose during the coming year. The other items are the same as for last year.

"Only one appropriation in last year's budget was exceeded. This was the $4500 appropriated for the YEAR BOOK which was exceeded by about $400, because of special expenses in connection with the publication of the Collective Index, but this excess will be more than balanced by the receipts from the sale of this volume.

"Because of the stringency of the times, which will probably result in a loss of some income because of non-payment of dues, the Committee believes that we should continue to watch with more than ordinary care the relationship between income and expenditures during the year."

APPROPRIATIONS FOR GENERAL EXPENSES.

| | |
|---|---|
| No. 1 Salaries | $11,700.00 |
| No. 2 Rent | 1,020.00 |
| No. 3 Telegraph and Telephone | 200.00 |
| No. 4 Clerical Expenses | 1,500.00 |
| No. 5 Printing, Postage and Stationery | 1,300.00 |
| No. 6 Office Supplies | 150.00 |
| No. 7 Traveling Expenses | 1,300.00 |
| No. 8 Premium on Bonds | 60.00 |
| No. 9 Auditing | 75.00 |
| No. 10 Certificates | 50.00 |
| No. 11 Miscellaneous Expenses | 150.00 |
| No. 12 Scientific Section | 25.00 |
| No. 13 Section on Education and Legislation | 25.00 |
| No. 14 Section on Practical Pharmacy and Dispensing | 25.00 |
| No. 15 Section on Commercial Interests | 25.00 |
| No. 16 Section on Historical Pharmacy | 25.00 |
| No. 17 Commission on Proprietary Medicines | 50.00 |
| No. 18 Committee on Local Branches | 25.00 |
| No. 19 Committee on Membership | 1,000.00 |

| | |
|---|---|
| No. 20 Committee on State and National Legislation | 100.00 |
| No. 21 Committee on Syllabus | 50.00 |
| No. 22 Committee on Unofficial Standards | 100.00 |
| No. 23 Committee on Colored Glass Containers | 50.00 |
| No. 24 Drug Trade Bureau of Public Information | 400.00 |
| No. 25 International Pharmaceutical Federation | 120.00 |
| No. 26 Metric Association | 10.00 |
| No. 27 American Conference on Hospital Service | 25.00 |
| No. 28 Headquarters Building Campaign | 2,000.00 |
| No. 29 YEAR BOOK | 4,500.00 |
| No. 30 Library | 100.00 |
| | $26,160.00 |

APPROPRIATIONS FOR OPEN ACCOUNTS.

| | | |
|---|---|---|
| No. 31 JOURNAL: | | |
| (*a*) Publication | $9,500.00 | |
| (*b*) Clerical Expenses | 1,000.00 | |
| (*c*) Postage and Stationery | 300.00 | |
| (*d*) Freight, Drayage and Miscell | 200.00 | |
| | | $11,000.00 |
| No. 32 National Formulary | | 1,000.00 |
| No. 33 Recipe Book | | 1,000.00 |
| No. 34 Badges and Bars | | 50.00 |
| | | $13,050.00 |
| | | $39,210.00 |

(*Motion No. 21*) *It is moved by Bradley that the Budget for 1931 as submitted be approved.*

*69. Selection of Auditors.* The Chairman of the Committee on Finance recommends the employment of W. A. Johnson & Company, Baltimore, Md., to audit the accounts of the ASSOCIATION for 1930 in accordance with Article 8 of Chapter IV of the By-Laws. This Company has audited the accounts since 1922.

(*Motion No. 22*) *It is moved by Bradley that W. A. Johnson & Co. be employed to audit the accounts of the Association for 1930 at the budget appropriation.*

*70. Contract for Printing and Mailing the Journal of the A. Ph. A. for 1931.* The following communication has been received from Chairman DuMez of the Committee on Publications:

"I have in hand the bids obtained by Editor Eberle on the cost of publishing the JOURNAL OF THE ASSOCIATION for 1931.

"After having given these bids fairly close study, I find that there will be no advantage to the ASSOCIATION in changing the publisher at this time. The results of these bids have been submitted to the Committee on Publications and as its chairman I, therefore, recommend to the Council that our contract with the Mack Printing Company for the publication of the JOURNAL be renewed for the coming year, the terms to be the same."

(*Motion No. 23*) *It is moved by DuMez that the contract for printing and mailing the Journal for 1931 be awarded to the Mack Printing Company of Easton, Penna.* At the request of Chairman DuMez, a vote on this motion is called for at this time but will be considered as tentative if there is objection.

*71. Committee on U. S. Pharmacopœia.* President Christensen has appointed Mr. Theodore F. Hagenow of St. Louis, Mo., as a member of this Committee to fill the unexpired term of Mr. William Mittelbach, deceased, which will terminate in 1935.

*72. Life Membership.* Mr. F. W. Dickson, Philadelphia, Pa., has become a Life Member through the payment of $25.00.

*73. Applicants for Membership.* The following applications properly endorsed and accompanied by the first year's dues have been received.

No. 110, Carl A. Abend, Grace Hospital, Detroit, Mich; No. 111, Chas. E. Autram, Hibbs, Pa.; No. 112, Edward Anzelmi, 966 E. 29th St., Brooklyn, N. Y.; No. 113, William B. Baker, 609 W. Franklin St., Baltimore, Md.; No. 114, Luther Bowen, 113 G. Saybrook Apts., Pittsburgh, Pa.; No. 115, F. R. Braune, 306 S. Wabash Ave., Chicago, Ill.; No. 116, H. J. Brumersky, 246 Greeve St., Conemauch, Pa.; No. 117, George F. Cartland, 310 Elm St., Kalamazoo, Mich.; No. 118, Duane Orin Crummett, 5021 Brooklyn Ave., Seattle, Wash.; No. 119, Bernard Benjamin Dickman, 2133 Centre Ave., Pittsburgh, Pa.; No. 120, Clark T. Eidsmoe, College Station, Brookings, S. Dak.; No. 121, Domenick Fanelli, 115 West 68th St., New York, N. Y.; No. 122, Noel E. Foss, 601 Cathedral St., Baltimore, Md.; No. 123, John B. Frosst, P. O. Box 808, Montreal, Canada; No. 124, J. B. Fullerton, Upjohn Co., Kalamazoo, Mich.; No. 125, Louis Gdalman, 3059 N. Troy St.,

Chicago, Ill.; No. 126, Solomon Gershon, 5051 N. Glenwood Ave., Chicago, Ill.; No. 127, Paul H. Gevi, 1217 Davis Ave., Pittsburgh, Pa.; No. 128, Daniel Cooper Grove, 2766 Alameda Blvd., Baltimore, Md.; No. 129, Merrill C. Hart, Upjohn Co., Kalamazoo, Mich.; No. 130, Theodore Hill, Jr., 6956 Frankstown Ave., Pittsburgh, Pa.; No. 131, Hŏk Yin Jae, 522 W. 147th St., New York, N. Y.; No. 132, Morris Kantor, State Hospital, Poughkeepsie, N. Y.; No. 133, Edgar A. Kelly, 4215 Brooklyn St., Seattle, Wash.; No. 134, Irving Kern, 347 Vernon Ave., Brooklyn, N. Y.; No. 135, William H. Lange, 501 Fayette St., Belle Vernon, Pa.; No. 136, Booker Latimer, De Witt, Ark.; No. 137, Y. S. Loo, 1404 Lusitana St., Honolulu, Hawaii; No. 138, David S. Lyman, 2730 Isabella St., Evanston, Ill.; No. 139, James F. Malloy, 114 Ulysses St., Pittsburgh, Pa.; No. 140, L. Lavan Manchey, School of Pharmacy, University of Maryland, Baltimore, Md.; No. 141, R. Lincoln McNeil, 2900 N. 17th St., Philadelphia, Pa.; No. 142, Sebastian B. Mecca, 79 Lincoln Ave., Clifton, N. J.; No. 143, Ellis E. Moore, 431 Orchard St., Pittsburgh, Pa.; No. 144, Kenneth P. Moore, 513 N. Linn St., Iowa City, Iowa; No. 145, George V. Murphy, 249 West Sixth St., East Liverpool, Ohio; No. 146, Irene Peterson, Glendo, Wyo.; No. 147, Vito Armando Pittaro, 590 Morris Ave., New York, N. Y.; No. 148, W. Arthur Purdum, 5500 Harford Road, Baltimore, Md.; No. 149, John L. Roberts, 807 Humboldt St., Santa Rosa, Calif.; No. 150, Chas. G. Samuelson, Milford, Nebr.; No. 151, Paul S. Shattuck, 322 Neal Ave., Ironton, Ohio; No. 152, Horace A. Shonle, 3493 Birchwood Ave., Indianapolis, Ind.; No. 153, C. N. Sprankle, 141 Sheetz St., West Lafayette, Ind.; No. 154, David Tolchinsky, 2621 South Michigan Ave., South Bend, Ind.; No. 155, Daniel P. N. Tsao, 4732 11th Ave., N. E., Seattle, Wash.; No. 156, Casimir J. Vaikasas, 1749 S. Halstead St., Chicago, Ill.; No. 157, J. C. Walton, Box No. 772, Steubenville, Ohio; No. 158, Max Waytz, 715 S. Wood St., Chicago, Ill.; No. 159, Lyle Howard Wellman, Box 7, Index, Wash.; No. 160, Edwin Charles Wise, Upjohn Co., Kalamazoo, Mich.; No. 161, Albert James Wynne, 2159 N. 61st St., Seattle, Wash.

(*Motion No. 24*) *Vote on applications for active membership in the American Pharmaceutical Association.* E. F. KELLY, *Secretary.*

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## OPIUM AND COCA IMPORT QUOTAS.

Slightly increased imports of crude narcotic drugs next year will be permitted by the Bureau of Narcotics. Harry J. Anslinger, Commissioner of Narcotics, has announced import quotas of crude opium and coca leaves for 1931. The 1931 import limits were set by the commissioner at 135,000 pounds of crude opium and 225,000 pounds of coca leaves. This allotment is tentative, and may be increased slightly to accommodate a few pharmaceutical houses which usually import small amounts but which have not yet supplied sufficient evidence to secure import permits. The 1930 import allotments were 128,000 pounds of crude opium and 201,000 pounds of coca leaves, which was considered a rather conservative amount. This is the first import quota fixed since the establishment of the Bureau of Narcotics.

Treasury Decision 4 was issued on November 19th by the Secretary of the Treasury, providing regulations granting the right of appeal to the Secretary of the Treasury from any order, rule or decision of the Commissioner of Narcotics, or his failure to rule upon or decide any matter. This is provided in Section 5 of the Porter Act. Notice of intention to appeal must be served in writing on the Commissioner within ten days from the date of the order, rule or decision. The petition must set forth clearly the complaint and the facts and arguments in support thereof, and may be supported by evidence in the form of affidavits, depositions and duly authenticated documents and records.

## HOSPITALS IN ARGENTINA.

The city of Buenos Aires contains thirteen municipal hospitals which treat approximately 7000 patients each month. In addition to these, the Asistencia Publica, provided specifically for the treatment of the indigent gratuitously or at a nominal price, is a centrally located institution with eight dispensaries throughout the city. This hospital served 88,404 persons in 1929, and is considered an excellent market for drugs and hospital supplies. Contracts for the necessary articles are made once a year and bids are supplied by dealers representing the drug manufacturers of several countries. (Consul A. M. Warren, Buenos Aires.)

# EDITORIAL NOTES

Editor: E. G. Eberle, 10 West Chase Street, Baltimore, Md.

Members of the Council, A. PH. A.: S. L. HILTON, *Chairman;* CHARLES H. LAWALL, *Vice-Chairman;* E. F. KELLY, *Secretary,* H. V. ARNY, A. G. DUMEZ, H. A. B. DUNNING, H. C. CHRISTENSEN, C. E. CASPARI, J. H. BEAL, W. BRUCE PHILIP, T. J. BRADLEY. *Ex-Officio Members:* H. C. CHRISTENSEN, *President;* WALTER D. ADAMS, D. B. R. JOHNSON, *Vice-Presidents;* C. W. HOLTON, *Treasurer;* E. G. EBERLE, *Editor of the Journal;* A. G. DUMEZ, *Editor of the Year Book;* C. B. JORDAN, *Chairman of the House of Delegates.*

Collaborators: The Members of the Council; E. FULLERTON COOK, *Chairman,* U. S. P. Revision Committee; E. N. GATHERCOAL, *Chairman,* N. F. Revision Committee; Chairmen of the Sections, A. PH. A.; E. E. SWANSON, B. V. CHRISTENSEN, RALPH E. TERRY, JOS. G. NOH, J. T. LLOYD; J. W. STURMER, *President,* A. A. C. P.; CHARLES B. JORDAN, *Chairman,* Executive Committee, A. A. C. P.; W. M. HANKINS, *President,* N. A. B. P.; HENRY C. CHRISTENSEN, *Secretary,* N. A. B. P.

## PHARMACY IN HOLLAND DURING 1930.

BY T. POTJEURJD.*

The Dutch Pharmaceutical Association held its annual meeting this year in Groningen. Among the resolutions adopted are the following:

The pharmacist cannot be responsible for patent medicines he distributes, hence, members thought it desirable to coöperate by establishing a laboratory of the Dutch Pharmaceutical Association. The chief of this laboratory and his chemist-assistants must verify the composition of patent medicines being imported in larger lots, before they are distributed to the pharmacists.

In many smaller places in Holland is only one pharmacy, which seem to be unsalable. If these pharmacies are discontinued doctors are entitled to open a pharmacy and to keep it even if, later, a new pharmacy is opened. To prevent the loss of such places the Dutch Pharmaceutical Association bought a number of such pharmacies which were exploited for account of the Dutch Pharmaceutical Association.

The resolution of the general meeting, to form a Limited Company of which the Dutch pharmacists are shareholders, intends to put the exploitation in a more commercial direction and to safeguard the finances of the Dutch Pharmaceutical Association. The cooperation of the chief-pharmacists of these shops leads to the preparation of hypodermic injections in one of the pharmacies, of galenical preparations in another, etc.

* Pharmacist in University Hospital, Leyden, Holland, responsive to "Events of 1930 That Have a Direct or Indirect Interest for Pharmacists," JOURNAL A. PH. A., December 1930.

## THE VESTAL BILL PASSES HOUSE.

After eight years of struggle the Vestal Copyright bill has passed the House and gone to the Senate. Why it should have taken so long to reach a decision on this measure it is hard to say, for seemingly the enactment does no more than extend to the products of man's mental labor the same protection of law now covering the products of manual labor.

## NATIONAL WHOLESALE DRUGGISTS' ASSOCIATION.

The N. W. D. A. Committee on Research and Relations is arranging for window display material to be used during 1931 for the vacation season, Pharmacy Week, and Christmas. Chairman Wm. Ochse announces a striking window display poster for First Aid Week, March 15th–21st. This poster may be used as a single unit or as four separate units; it is lithographed in six colors, size of sheet 44 by 64 inches. In a way that will attract attention, pictures are shown of accidents and the first aid given by mothers, etc. The legends emphasize the importance of being prepared for first aid treatment.

All of the displays are being prepared at the present time and special attention is being given to the inauguration of merchandising ideas along with the displays, so as to make them effective selling aids.

The coöperative work of the N. W. D. A. deserves commendation and encouragement; it is certainly worth while and the satisfaction

is, that there is constantly growing improvement.

An informal meeting of wholesale druggists and N. W. D. A. Board of Control will be held in St. Louis, May 4th–7th.

## COMMITTEE ON THE COSTS OF MEDICAL CARE.

The Committee on the Costs of Medical Care was organized to study the economic aspects of the prevention and care of sickness, including the adequacy, availability and compensation of the persons and agencies concerned. The Chairman is Dr. Ray Lyman Wilbur. Following the latter's address at the annual meeting the principles proposed by him were discussed by the committee and after revision they were adopted as they appear below:

1. The personal relation between physican and patient must be preserved in any effective system of medical service.

2. The concept of medical service of the community should include a systematic and intensive use of preventive measures in private practice and effective support of preventive measures in public health work.

3. The medical service of a community should include the necessary facilities for adequate diagnosis and treatment.

## NEW YORK PHARMACEUTICAL ORGANIZATIONS PROVIDE FOR UNEMPLOYED.

The twelve New York local pharmaceutical organizations have joined their efforts to aid the unemployed. Definite steps will be taken at an "All-in-One" banquet to be held at the Commodore Hotel on January 28, 1931.

## NEWS BULLETINS OF THE DRUG TRADE BUREAU OF PUBLIC INFORMATION.

Director Robert P. Fischelis has issued further bulletins of the Drug Trade Bureau of Public Information. Bulletin No. 47 relates to the address of President Frank, of the University of Wisconsin, before the Golden Jubilee meeting of the Wisconsin Pharmaceutical Association. Parts of these addresses are printed in the October JOURNAL, 1930, A. PH. A., page 1049. Bulletin No. 48 refers to the timely suggestion for changes and additions to the pharmacy laws of the various states by President H. C. Christensen, who is also Secretary of the N. A. B. P. The article is published in the JOURNAL of the A. PH. A. Bulletin No. 49 refers to the meeting of the National Drug Trade Conference in part reported in this number of the JOURNAL. Bulletin No. 50 refers to a number of papers presented to the Scientific Section of the A. PH. A. by action of representations of various drug trade organizations at the recent meeting of the National Drug Trade Conference. The work of the Drug Trade Bureau of Public Information is to be continued.

## SOLUTION OF MAGNESIUM CITRATE.

At a recent meeting of the officials and chairmen of the standing and special committees of the New York State Association, held in Albany, the Sub-Committee on Waters, Solutions, Spirits, Syrups and Elixirs of the United States Pharmacopœial Convention was called upon to modify the existing magnesia formula in order to permit a more palatable product.

The entire membership of the State Association has been circularized by the chairman of the Committee on Information in an effort to curtail the use of substitute and imitation magnesias. The New York Pharmaceutical Conference is coöperating.

## PHILADELPHIA MEETING OF PHYSICIANS AND PHARMACISTS.

The annual pharmacists' and physicians' meeting under the auspices of the Philadelphia Retail Druggists Association, was held December 5th. Addresses for the physicians were made by Dr. George P. Muller, president of the Philadelphia County Medical Society, Dr. Mitchell Bernstein and Dr. Bernard Fantus; for pharmacists, by Prof. Charles H. LaWall, Ambrose Hunsberger, E. Fullerton Cook, and Secretary E. F. Kelly, of the A. PH. A.

Abstracts of the report of Committee on the Costs of Medical Care was read by Secretary Pickett.

The consensus of opinion was that medical colleges should give more attention to the teaching of materia medica. President Muller suggested that the pharmacists of Philadelphia make a display of U. S. P. and N. F. preparations at the meeting of the American Medical Association, to be held in June.

## PERSONAL AND NEWS ITEMS.

**George Eastman,** of Rochester, N. Y., is reported to have given $1,000,000 to the city of Stockholm, Sweden, for a dental dispensary similar to the Rochester Dental Dispensary and those recently established by him in London and Rome. The former includes a feature not provided for in the two latter, namely, a school for dental hygienists.

**Dr. J. Howard Brown,** professor of bacteriology in the School of Medicine, Johns Hopkins University, was elected president of the Society of American Bacteriologists at the recent meeting in Boston.

**Dr. L. V. Redman,** Bloomfield, N. J., has been chosen president-elect of the American Chemical Society for 1932. He will succeed Prof. Moses Gomberg, of the University of Michigan, who became president January 1, 1931, having been chosen president-elect a year ago.

**George H. Needham,** Paterson, N. J., was elected president of New York Microscopical Society at its annual meeting, held June 2nd, in New York City, at the American Museum of Natural History.

**Dr. F. E. Stewart,** a former *Honorary President* of the AMERICAN PHARMACEUTICAL ASSOCIATION, has moved from Philadelphia to Englewood, N. J.

**Charles H. LaWall** addressed the Minehart Scientific Society of Temple University, Philadelphia, on "Early Writings and Publications of Pharmacy." The address was illustrated by lantern slides.

He also addressed the National Association of Dairy, Food and Drug Officials at New Orleans on "Pharmacopœias and Pharmacopœial Revisions."

**Charles H. Paul,** former assistant in analytical chemistry at the Philadelphia College of Pharmacy and Science, is now pharmacist at the Methodist Episcopal Hospital, Philadelphia.

**President C. Leonard O'Connell** and **Secretary J. B. Pilchard,** of Pennsylvania Pharmaceutical Association, recently addressed Temple University pharmacy students.

**Charles C. Sniteman,** pharmacist of Neillsville, Wis., since 1879 and member of the AMERICAN PHARMACEUTICAL ASSOCIATION for fifty years, celebrated his 80th birthday on September 17th. **George Lewis Sontag,** who has been associated with Mr. Sniteman as pharmacist for 48 years, is also a member of the A. PH. A. These are records seldom surpassed; congratulations are extended to the youthful veterans.

**Wolfgang Schnellbach,** a graduate of the University of Heidelberg, who also received a Ph.D. from the University of Berne, is now employed as a research chemist by Merck and Company, at Rahway, New Jersey. He has been doing advanced research work at the P. C. P. & Sc. on the solubility of some U. S. P. substances. Some of his researches were published in the JOURNAL. Dr. Schnellbach is a member of the A. PH. A.

**Chairman C. B. Jordan,** of the House of Delegates, A. PH. A., in *Medical Economics* for December writes on "Pharmacy Deserves Your Confidence." He brings to the attention of physicians the importance of pharmacy and its progress. We quote from the closing paragraph: "When medicine and pharmacy cooperate, public health is better served and this, after all, is the ultimate aim and purpose of each profession."

**John A. Goode** accepted, temporarily, an appointment as Commissioner of Public Safety of Asheville, until the position could be permanently filled. A strong effort was made to have him accept the important office, but Mr. Goode finding this impossible his resignation was accepted with regrets.

**Moritz Dittmar** is at present in France, looking after interests of Lehn & Fink.

**Prof. Carl Becker,** of Cornell University, was elected president of the American Historical Association. The Association will meet next year in Minneapolis.

*Das Chemische Zentralblatt,* official publication of the German Chemical Society, is celebrating the conclusion of 100 years of service.

**Theodore Weicker,** general manager of E. R. Squibb & Sons, was honored by his associates on the occasion of the 25th anniversary as Executive. Vice-President, F. W. Nitardy, presided at the ceremonies in connection with a presentation made to Mr. Weicker, at which time 300 or more associate executives and fellow employees were present at the delightful function.

**J. U. Lloyd,** oldest living ex-president of the AMERICAN PHARMACEUTICAL ASSOCIATION—whose writings and research of fifty years ago contributed largely to colloidal chemistry—has recently added another number to his Folk Lore studies of Northernmost Kentucky.

Thirty-five years ago he gave to the public his scientific novel "Etidorpha," then followed "Stringtown on the Pike," "Warwick of the Knobs," "Red Head." The recent publication is entitled "Felix Moses, the Beloved Jew of Stringtown on the Pike;" he has interwoven fact and folk lore with fiction in the life experiences of "a unique character whose romantic record challenges imagination." Under the influence of an ancient clock, two bosom friends and the author seated about the dinner table discuss events of long ago and these discussions with records and lore form the "warp and woof" of the narrative beautifully told. An author's edition for subscribers, carrying the facsimile signature of J. U. Lloyd has been published; it is a beautiful, illustrated volume.

The widows of two former *Presidents* of the A. PH. A. celebrated birthdays during January—Mrs. John F. Hancock and Mrs. Charles E. Dohme—the former has reached four score and ten and the latter a year ahead. It is a pleasure to report that at this time both of them are in fairly good health, happy, and interested in the events of the day.

**Dean A. Richard Bliss,** School of Pharmacy, University of Tennessee, stopped over in Baltimore on his return from New York City. As is well known Dr. Bliss is the editor of *The Mask*, of Kappa Psi Pharmaceutical Fraternity.

**Prof. Anton Hogstad, Jr.,** spoke on the subject: "The Changing Order of American Pharmacy" at the Philadelphia College of Pharmacy, December 11th; New Jersey College of Pharmacy, December 17th; New York College of Pharmacy, December 18th. He also addressed the staff of Merck & Co., Inc., on December 17th at Rahway, N. J.

**Prof. G. A. Burbidge,** responding to an article appearing in the *Canadian Pharmaceutical Journal* of December 1st, by Prof. H. J. Fuller, dealing with the question of certified clerks, discusses the subject at considerable length and closes by presenting two policies: (1) abolish the apprenticeship system and enforce the rule that none but graduate pharmacists do pharmaceutical work; (2) make provision for some recognized protection to the public in respect to non-graduate assistants.

Dr. W. M. Allen, Raleigh, N. Car., was elected *President* of the National Association of the Food and Drug Officials at the New Orleans meeting. Other officers are H. E. Weideman, Missouri, *Vice-President;* W. G. Geagley, Michigan, *Secretary-Treasurer;* J. W. Kellogg, Pennsylvania, *Executive Committee-Man;* W. S. Frisbie, *Relations Man* for the Food and Drug Administration at Washington.

Incident to the celebration of its Silver Anniversary to be held this year the American Druggists Fire Insurance Co. has adopted a plan to insure its continuous control by retail druggists.

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## SOCIETIES AND COLLEGES.

### IOWA PHARMACEUTICAL ASSOCIATION.

Iowa Pharmaceutical Association plans have been perfected for the meeting of the Iowa Pharmaceutical Association to be held at the Savery Hotel, Des Moines, February 4th to 6th. Among the speakers of the convention will be Dr. F. O. Taylor of Detroit, Dean Hugh C. Muldoon of Pittsburgh, A. J. Luther of Chicago and "Dusty" Miller of Ohio. Dr. W. F. Coover of Iowa State College will speak on the contribution of chemistry to pharmacy. Dr. R. A. Kuever will speak on the subject "Three Hundred Years of Cinchona." D. W. Aberle has as his subject, "Foot or Horseback." Congressman Clyde Kelly is expected to be present. Paul J. Jepson is the *President*, and J. W. Slocum, *Secretary*.

### MINNESOTA PHARMACEUTICAL ASSOCIATION.

President of the Minnesota Pharmaceutical Association, N. Vere Sanders, and Secretary Gustav Bachman announced that the 47th annual meeting of the Minnesota Pharmaceutical Association, scheduled for February 17th to 20th at the new Hotel Lowry in St. Paul, will follow somewhat different lines in its program than heretofore. The arrangements are in charge of H. Martin Johnson, Edward Seiberlich, Walter D. Fields and Bert Hyams.

As a result of their efforts, it is hoped to put on the biggest and best convention Minnesota has ever had. Among the speakers will be Dr. L. G. Rowntree of the Mayo Clinic and E. O. Thorsen, retail pharmacist of Akron, Ohio. A large part of the program will be in the form of playlets. One will be conducted by Harry Kyes, Secretary of the National Merchants' Association and the other by Prof. H. J. Ostlund of the School of Business Administration of the University of Minnesota. In these playlets it is intended to illustrate methods employed of retail experiments in meeting modern day drug store problems. Professor Ostlund will be assisted by Donald S. Barnes, whose "stocking" articles excited considerable comment about a year ago. Dr. Rowntree will review the relationship of pharmacy and medicine.

Dean Frederick J. Wulling will as usual have charge of the scientific and practical section and it is to be expected that this program will be interesting and valuable.

The 9th annual Northwestern Drug Show will be held at the Municipal Auditorium in St. Paul during the meeting of the Minnesota Pharmaceutical Association. The officers of the Bureau are: *President*, Henry C. Kruckeberg; *Vice-President*, Harry Iverson; *Secretary*, J. W. Slocum; *Treasurer*, Al Falkenheimer. Frank M. McCabe is the General Chairman of the show. The public will be invited during the evenings.

## NEW JERSEY PHARMACEUTICAL ASSOCIATION.

The mid-winter meeting and dinner dance of the New Jersey Pharmaceutical Association will be held at the Robert Treat, Newark, N. J., on January 27th. While the meeting will be largely given over to entertainments there will also be business sessions, including a discussion relative to changes in the constitution and by-laws of the Association.

## INSECTICIDE AND DISINFECTANT MANUFACTURERS' ASSOCIATION.

A convention of the Insecticide and Disinfectant Manufacturers' Association was held at the Hotel McAlpin in New York City, December 8th–10th. Dr. R. C. Roark of the Bureau of Chemistry and Soils presented a paper on "Rotenone." He stated that rotenone was effective and harmless to domestic animals and that it was cheaper than pyrethrum. Among the actions taken at the meeting was the result of a motion to bring about an amendment of the Insecticide Act. This amendment would recognize the need for additional authority to regulate the sale and shipment of disinfectants.

There was considerable discussion relative to technical terms in which Dr. G. F. Reddish, C. C. Concannon, W. S. Abbott and others participated.

Robert C. White of Philadelphia was re-elected *President*. Evans E. A. Stone of New York was elected *First Vice-President;* E. B. Loveland of New York, *Second Vice-President;* and John Powell of New York, *Treasurer*. Harry W. Cole of Holbrook, Mass., was re-elected *Secretary*.

## PHARMACY COMMITTEE, CHICAGO WORLD'S FAIR.

A meeting of the Pharmacy Committee of Chicago World's Fair was held at Hotel Washington, December 11th. President H. C. Christensen of the A. PH. A. presided and E. F. Kelly acted as secretary. The desirability of representation at the Chicago World's Fair in 1933 was presented by President Christensen and, in order to do this effectively, he stated that coördinated coöperation was essential to success. The following representatives were present:

H. C. Christensen and E. F. Kelly, AMERICAN PHARMACEUTICAL ASSOCIATION; A. S. Butdick, American Drug Manufacturers' Association; C. H. Searle, American Pharmaceutical Manufacturers' Association; J. H. Riemenschneider, National Association of Retail Druggists; E. L. Newcomb, National Wholesale Druggists' Association; L. K. Riggs, American Association of Colleges of Pharmacy; A. C. Taylor, National Association Boards of Pharmacy; E. F. Kemp, Proprietary Association; E. F. Cook, U. S. P. Convention; W. L. Scoville, National Formulary Committee; E. N. Gathercoal, National Conference on Pharmaceutical Research; C. C. Pierce, Public Health Service; H. R. Watkins, Food and Drug Administration.

In addition to these representatives, the following visitors were present and were requested to take part in the meeting: A. L. I. Winne, E. G. Eberle, S. L. Hilton.

The Chairman requested Prof. E. N. Gathercoal to outline the scope and purpose of the International Exposition to be held in Chicago

in 1933, which will portray the progress in the professions, sciences and industries. He said that the exposition was not sponsored by the city of Chicago but by its prominent citizens and that the progress so far made insured its success financially and as a unique exposition of scientific progress. He stated that the exhibits are not to be competitive or individual but combined for the purpose of illustrating the progress made by the respective professions, sciences or industries. They are to be scientific and educational in character, appealing to the public and be entertaining. He said that processes and operations should be shown in motion. Chairman Gathercoal stated that several of the professions and sciences have practically completed plans for their exhibits, among them physics and chemistry and that if pharmacy is to participate plans and reservations will have to be made promptly.

Those in attendance were called upon to state their opinion relative to whether pharmacy should be represented in the exposition and also to express their views relative to the character of the exhibit. Those in attendance were favorable to the purpose and enthusiastic, and it was moved that each representative should, as promptly as possible, present the matter to his organization and secure its approval and support.

Organization was perfected by the election of H. C. Christensen, *Chairman;* A. S. Burdick, *Vice-Chairman;* E. N. Gathercoal, *Secretary;* J. H. Riemenschneider, *Treasurer*. The organization was designated as "The Chicago World's Fair Centennial Celebration Sub-Committee on Pharmacy." The following were named as members of the Sub-Committee on Pharmacy, with power to elect additional members:

W. D. Adams, J. H. Beal, A. S. Burdick, F. A. Blair, H. C. Christensen, W. G. Campbell, E. F. Cook, H. A. B. Dunning, J. J. Durrett, A. R. L. Dohme, E. G. Eberle, R. P. Fischelis, E. N. Gathercoal, S. C. Henry, S. L. Hilton, H. Holthoefer, C. W. Johnson, C. B. Jordan, D. F. Jones, E. F. Kelly, R. D. Keim, Edward Kremers, Eli Lilly, T. R. Leigh, C. G. Merrell, E. Barrett Moxley, E. L. Newcomb, R. L. Patch, G. A. Pfeiffer, S. B. Penick, W. Bruce Philip, Otto Raubenheimer, J. H, Riemenschneider, L. K. Riggs, Thomas Roach, W. L. Scoville, A. Homer Smith, C. H. Searle, E. R. Seltzer, A. C. Taylor, F. J. Wulling, Charles Whitebread, J. H. Webster, R. A. Whiddon, R. C. Williams.

The general scope and character of the exhibit was freely discussed and the following divisions of the exhibit were suggested:

1.—Sources and importation of crude drugs.
2.—Sources and importation of medicinal chemicals.
3.—Sources and production of animal drugs.
4.—Medicinal food accessories—vitamins, etc.
5.—Pharmaceutical education, colleges, literature, journals, associations.
6.—Drug control and its extension, law, rules, regulations.
7.—Manufacturing operations—pills, tablets, ampuls, etc.
8.—Modern methods of packaging drugs and medicines.
9.—U. S. P. and N. F. and other standards of this and other countries.
10.—Pharmacies—ancient and modern dispensing and selling.
11.—Pharmaceutical research.

From data available at the present time it was estimated that from $40,000 to $50,000 would be required to cover the expenses incidental to the exhibit, including the salary of the Director for approximately two years and such assistants as would be required.

## NATIONAL DRUG TRADE CONFERENCE.

The annual meeting of the National Drug Trade Conference was held in Hotel Washington, December 10th, with a representative attendance. The Treasurer's annual report, covering the period from December to December, was read, accepted and approved.

President Henry stated that as Mr. Wroe Alderson of the Department of Commerce was present he would call on Mr. Cloughly to read the report of the Executive Secretary, which outlined the surveys which had been made and suggestions for the survey to be made in St. Louis. Following this Mr. Alderson spoke briefly outlining the plans for the survey. Reference to the survey has been made in two of the preceding numbers of the JOURNAL.

Chairman Rudd presented the report for the Committee on the Status of Pharmacy and the Drug Trade. The report discussed the general situation relative to pharmacy and other activities. The committee contended that at least three types of training are necessary for

the success of the pharmacist. The pharmacist must leave the college of pharmacy as a safe man to prepare and dispense products which have to do primarily with health. He must have a fair measure of culture. The four-year course of pharmacy curricula was approved, and it was emphasized that pharmacy should receive benefit from those who had profited by pharmacy in making a success. Reference was made to the suggestion of Dr. James H. Beal that pharmacists receive training in first-aid. The recommendations of the Committee received the endorsement of the Conference.

It was voted that the president of the Conference appoint a committee to prepare a table of potent and toxic drugs. The Conference also gave its approval to the plan to simplify glass containers. The latter report was received and the sense of the Conference was expressed in that when legislation is proposed the statement upon containers of the weight, measure or numerical count of the contents thereof, drugs and medicines should be exempted from such requirements when the contents shall be two fluidounces, or less; three avoirdupois ounces by weight or less; or if, by numerical count, shall be six units or less.

S. L. Hilton made a report as Councilor to the Chamber of Commerce, U. S. A. The Conference directed that when there was unanimous action by the body authorizing its Councilor to vote such action would be in accord with the rules and regulations of the Conference. The Councilor is not to vote for the Conference on any referenda.

The report of the Committee on Uniform State Narcotic Act was presented by Chairman A. C. Taylor. This report is to be submitted to the members of the Conference.

There was considerable discussion relative to the enforcement of the Pure Food and Drugs Act; no definite action was taken.

Chairman Hunsberger reported for the Committee on the Cost of Medical Care, stating that the objects and purposes of the Committee are to learn the adequacy of all forms of medical care and the cost to the public and to determine, if possible, how such care may be improved and the cost reduced. He said that pharmacy represents an important and necessary division in medical care. Dr. R. P. Fischelis, a member of the research staff of the Committee, stated that this was a fact-finding body, that its recommendations would be based on the facts as and when they were developed and that no preconceived notions as to the necessary remedy for the conditions as found would influence the decisions of the Committee.

The Capper-Kelly Fair Trade Bill was reapproved. The Conference again voiced its approval of the proposed Pharmacy Corps Bill for the U. S. Army and it was pointed out that there was much strong sentiment in favor of the passage of the bill. Discussions by pharmaceutical leaders and the Surgeon General of the Army, it was stated, brought a possibility of mutually satisfactory arrangements to be worked out for improved conditions in the army relative to pharmacy.

A discussion was had on the Porter narcotic bill read by Carson P. Frailey.

H. C. Christensen described the work of the Drug Trade Bureau of Public Information and considerable attention was given the topic of publicity to the drug trade in general.

The election of officers resulted as follows:

*President*, Carson P. Frailey; *Vice-President*, Ambrose Hunsberger; *Secretary-Treasurer*, E. F. Kelly; *Councilor to the Chamber of Commerce, U. S. A.*, S. L. Hilton.

A rising vote of thanks was tendered the retiring president, Samuel C. Henry, who had efficiently served the Conference in that capacity for the past ten years.

The members of the Executive Committee for the ensuing year are: W. L. Crounse, Harry Noonan, A. G. DuMez, R. E. L. Williamson, H. B. Thompson and A. C. Taylor.

## AMERICAN CONFERENCE ON HOSPITAL SERVICE.

The annual meeting of the American Conference on Hospital Service will be held at the Palmer House, Chicago, February 18th. The Symposium on Convalescent Care will be presided over by Harry E. Mock, M.D., and the Joint Session with the Section on Physical Therapy of the American Medical Association will conduct its session under the guidance of Surgeon General Merritte W. Ireland. The AMERICAN PHARMACEUTICAL ASSOCIATION holds membership in the Conference. In conjunction with the Conference sessions of the Congress on Medical Education, Medical Licensure and Hospitals of the American Medical Association will be held.

# OBITUARY.

## MAURICE ASHBEL MINER.

Maurice A. Miner, member of the A. PH. A. since 1880, died at his home in Chicago, December 11th. He was born near Randall, Wis., in 1849, and received his early education at Lake Geneva, Wis. Thereafter, he entered the School of Pharmacy of the University of Michigan and was graduated in 1871 with the degree of Ph.C. After further postgraduate work he engaged in the retail drug business at Lake Geneva.

In 1878, Mr. Miner came to Chicago as chemist for Morrisson, Plummer & Co. When the Northwestern University School of Pharmacy was organized he was elected member of the faculty and upon the death of Prof. Oscar Oldberg he succeeded him as professor of pharmacy. In the merger of this institution with the University of Illinois School of Pharmacy Professor Miner became professor of pharmacy, serving until his retirement several years thereafter.

A sketch of the deceased will be found in the September JOURNAL A. PH. A., for 1928. He was deeply interested in the ASSOCIATION; as a teacher, he was beloved by his students and, in his contact with co-workers, he was invariably considerate.

## CHARLES GALE SHEDD.

The *Manchester Union* (New Hampshire) of November 17th contained the following item regarding the late Hon. Charles Gale Shedd, member of the AMERICAN PHARMACEUTICAL ASSOCIATION:

"Keene and Cheshire county lost one of its most popular men Saturday, November 15th, when Charles Gale Shedd, former mayor and prominent business man, died suddenly from a heart attack in his place of business—the Bullard and Shedd Company of which he was proprietor. Mr. Shedd was 65 years old.

"Besides being one of Keene's veteran business men Mr. Shedd was actively interested in civic affairs, and within the past two weeks, he had been named as president of the Bureau of Public Service, and had mapped out a program for the organization in connection with its charitable work.

"Mr. Shedd was born in South Wallingford, Vt., a son of Capt. Charles W. and Sarah Doty Shedd. Previous to graduating from Keene High School, Mr. Shedd entered the employ of the Bullard and Foster Drug company at the age of 15 and became the owner of the store in 1899. On May 19th Mr. Shedd was given a testimonial dinner at the Cheshire House by his employees and friends in observance of the completion of 50 years in the drug business.

"Mr. Shedd was mayor of Keene in 1911–1913, inclusive; he also served as a representative and state senator. Mr. Shedd was a former president of the Keene Chamber of Commerce and a member of the present board of directors. He was a past-president of the Keene Rotary club and the Keene Chorus club. He was a member of the Masonic bodies and a 33rd degree Mason. During the World war Mr. Shedd was in charge of a Red Cross supply station in Paris."

## BENJAMIN LINDLEY MURRAY.

Benjamin L. Murray, member of the AMERICAN PHARMACEUTICAL ASSOCIATION since 1896, died at his home in Rahway, N. J., December 12th. He had been associated with Merck & Co. since 1897, and as chief chemist in charge of the control laboratory for a number of years.

Mr. Murray was born in Ypsilanti, Mich., August 4, 1870. He was an alumnus of the University of Michigan, graduating from this institution in 1897 as B.Sc. in chemistry. In 1905, he received the Master's degree from Columbia University.

The deceased was a member of U. S. P. X Revision Committee, and his advice and assistance were frequently sought by federal and state officials. He was author of "Standards and Tests for Reagent and C. P. Chemicals," and a member of a number of scientific societies of the United States and in foreign countries. He was a man of high ideals and contributed largely to improving standards of materia medica.

The deceased is survived by his widow and three sons.

## CYRUS BURTON WARNE.

Members of the AMERICAN PHARMACEUTICAL ASSOCIATION who attended the meeting at Rapid City, S. Dak., will recall the genial Cyrus B. Warne who took an active part in that convention, and many were saddened by his passing on November 1, 1930. Mr. Warne was born at Whitewater, Wis., June 17, 1879. As a youth he moved to Mitchell, S. Dak., with his parents. He was licensed to

practice pharmacy in 1904 and established a drug business in Redfield soon thereafter, in which he was eminently successful.

A local paper spoke of him as follows:

> "Redfield paused Wednesday in her activities to pay the last honors to one of her most beloved citizens. Seldom has there been a funeral where cold formality was more forgotten and all those gathered were one in the sorrow of the moment. For never did a man live in this community who was more universally respected and loved by everyone than was Cyrus B. Warne. And never was there one whose untimely death will cause a greater rift in the life of the entire community."

Mr. Warne stood high in Masonic circles, and the funeral services were conducted by the officers of South Dakota Grand Lodge. The pall bearers were: Rowland Jones, Jr.; Floyd Brown, Fred L. Vilas, H. J. Schnaidt, Henry Perriton, George Sherman, M. E. Crocket and T. C. Rutherford.

Other pharmacists of the state present at the funeral ceremonies were A. A. Woodward, D. F. Jones, E. R. Serles, E. M. Jones, F. S. Bockoven, Fred Smith, H. H. Humphrey, W. L. Buttz, S. H. Scallin, W. H. Scallin, Mitchell T. Weisflock and W. M. Michel.

The deceased is survived by his widow, to whom sympathy is expressed.

## ARCHER T. DAVIS.

Archer T. Davis, prominent pharmacist of Decatur, Ill., and past-president of the Illinois Pharmaceutical Association and member of its Executive Committee, died in the Decatur and Mason County Hospital, Monday morning, December 22nd, following an operation for appendicitis. Mr. Davis was a member of the AMERICAN PHARMACEUTICAL ASSOCIATION.

Archer T. Davis was born in Macon County, September 20, 1894. He was the youngest son of Amos T. and Mary Myers Davis. His paternal grandparents came to Illinois in 1829, being one of the pioneer settlers of the central part of the state. He obtained his education in the Decatur public schools, and was graduated from the Decatur high school in 1894.

In 1896 Mr. Davis opened a drug store on West Main Street, and remained at this location until the time of his death. The James Millikin University is near by, and Mr. Davis' drug store became closely identified with the traditions of the university, and enjoyed a large patronage from its students.

Mr. Davis was married to Miss Lucinda Whitfield, who survives him and two married daughters, Mrs. Dorothy Davis of Decatur and Mrs. Charlotte Whitfield of Aurora, Illinois.

The deceased had a deep interest in pharmaceutical organizations, and was especially active in the Illinois Pharmaceutical Association which he served successively as vice-president, president and member of the Executive Committee. He presided at the fiftieth anniversary convention in Springfield last June, and took part in the annual meeting of the Executive Committee last month. He was not only an excellent pharmacist and a public-spirited citizen, but was also a man of fine personality and high character. He leaves a host of friends to mourn his passing.—W. B. D.

## FRANK C. WATERBURY.

Frank C. Waterbury, founder of Waterbury Chemical Co., Des Moines, Iowa, and member of the AMERICAN PHARMACEUTICAL ASSOCIATION, died December 8th, aged 64 years.

Mr. Waterbury was a native of Illinois and came to Iowa with his parents as a youth. He first engaged in retail pharmacy and thereafter organized the Waterbury Chemical Co. He took an active part in the Des Moines meeting of the AMERICAN PHARMACEUTICAL ASSOCIATION and exhibited considerable interest in the promotion of the Headquarters Building.

The deceased was also president of the Waterbury Investment Co. and of the Greenwood Investment Co., and a number of other large Iowa interests. He is survived by a widow and a son and daughter.

## HENRY LEFFMANN.

Dr. Henry Leffmann died Christmas Day at his residence in Philadelphia, in his eighty-fourth year. He was a native of Philadelphia.

From 1884 to 1887 and again from 1901 to 1902 he was port physician, also city chemist for a number of years. He was graduated from the Jefferson Medical College in 1869 and later taught chemistry there, and for many years at Wagner Free Institute of Science. In 1884 he was elected professor of chemistry at the Pennsylvania College of Dental Surgery and in 1888 became professor

of chemistry at the Women's Medical College of Pennsylvania, retaining that position until 1923. Dr. Leffmann also gave instruction in toxicology at Jefferson Medical College and for a number of years lectured at the Philadelphia College of Pharmacy and Science.

Dr. Leffmann was author of the fifth edition of "Analysis of Water," of three editions of "Analysis of Milk and Milk Products," of "Select Methods of Food Analysis;" he edited the last four editions of "Reese's Medical Jurisprudence and Toxicology," of Volumes I and II of the fourth editions of "Allens Commercial Organic Analysis;" translated from the German of "Sanitary Relations of Coal Tar Colors," by Theodor Weyl. Members of the Franklin Institute will recall the excellent book reviews published in its *Journal*.

He conversed in several languages and had a reading knowledge of quite a number. He achieved prominence as a chemico-legal and medico-legal expert in a number of noted trials in which he appeared while serving as city chemist, as chemist attached to the coroner's office, that of the city prosecutor's, and while serving as chemist for the Pennsylvania Dairy and Food Commission.

Mrs. Leffmann died about a year ago.

### MARTIN J. NOLL.

Martin J. Noll, Field Secretary of Missouri Pharmaceutical Association, died December 6th, aged 56 years. The deceased was a native of Illinois. At the age of fourteen, he came to St. Louis and engaged as apprentice with C. G. Penny and, later, matriculated at St. Louis College of Pharmacy, from which institution he graduated in 1894.

Soon after graduation he engaged in the drug business in St. Louis on his own account, and at one time, he and a partner owned several stores, disposing of the last one in 1915. In succeeding periods Mr. Noll represented various pharmaceutical houses until, in 1924, he was elected Field Secretary of Missouri Pharmaceutical Association, in which capacity he served successfully and untiringly until his passing.

Mrs. Noll, a son, Edwin Raymond, and a daughter, Mrs. Florence Majers, survive the deceased.

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Sympathy is expressed to the bereaved:

Mrs. Rhodes—wife of our fellow member, Charles R. Rhodes, of Hyndman, Pa., a former president of Pennsylvania Pharmaceutical Association—died December 1st.

Mrs. F. M. Tompkins, Washington, D. C., sister of Secretary Samuel C. Henry, died December 31st. The deceased had been in a local hospital for several weeks on account of injuries sustained in an automobile accident.

Mrs. George V. Haering, wife of our fellow member, former president of the C. R. D. A., died January 2nd. The deceased had been seriously ill for several months.

**J. Walter Thompson,** J. Walter Thompson Company, according to an appraisal filed December 31st, left a gross estate valued at more than two million dollars. The estate was divided equally between his widow, Margaret R. Thompson, and his son, Walter Roosevelt Thompson.

## LEGAL AND LEGISLATIVE.

### SALE OF DRUGS BY ITINERANT VENDER PROHIBITED IN LOUISIANA.

Section 12 of the medical practice act of Louisiana, provides as follows:

That any itinerant vendor of any drug, nostrum, ointment or application of any kind, intended for the treatment of disease or injury, or who may by writing, print, or other methods, profess to cure or treat disease or deformity by any drug, nostrum, manipulation or other expedient in this state, shall, if found guilty, be fined . . . or shall be imprisoned.

The J. R. Watkins Company entered into a contract with one Robert Lee Brown, one of the defendants in this case, to sell to Brown certain drugs, or medicines, on the condition, among others, that he make at least four times a year "a thorough and personal canvass" of the territory assigned to him for the purpose of selling these medicines. Brown was unable to fulfil the terms of the contract and suit was instituted against him, and his sureties, by the Watkins Company. The lower court gave judgment for Brown apparently on the ground that the contract was illegal as proposing the itinerant vending of drugs in contravention of the section quoted, and the Watkins Company appealed to the Court of Appeals of Louisiana, First Circuit.

The object of the medical practice act, said the court, was to regulate the practice of medi-

cine by competent physicians or surgeons and to prevent its practice by unauthorized or incompetent persons. The attempt made in Section 12 to suppress itinerant venders of drugs was obviously incorporated in the statute for the prevention of the practice of medicine by quacks and mountebanks and such incorporation does not render the act unconstitutional. Counsel for the company contended that there was no penalty imposed for the mere vending of drugs, ointments and nostrums. The contention was that the only offense denounced is professing to prescribe for or treat. The section, said the Court, denounces the vending of drugs or nostrums by itinerant venders as a crime. It also provides against the professing, by printing or writing, to cure disease or deformity by manipulation or other expedient. The penalty is prescribed against the offender who violates the providence of the section in either of the ways stated. The words "profess to cure," continued the court, apply also to the mere vending of the drugs, since no sales of the nostrums would be possible unless the purchaser was promised a cure. Of necessity, such an affirmance by the itinerant vender must be implied in every sale. The word "profess," taken in its general sense, means "to acknowledge" "to avow," "to affirm." Every sale must necessarily carry an "avowal" or "affirmance" of the curative virtues of the nostrum. While Section 12 of the act is not perfect in point of diction or grammatical construction, the court said, the foregoing construction carries out the legislative purpose, which was to prevent the practice of medicine by the unqualified and the unauthorized.

The Watkins Company contended, finally, that the section in question interfered with interstate commerce and was therefore void. This section, the court said, was enacted for the protection of the public health of the state as a police regulation and is not subject to the objection made.

The Appellate Court could find no error in the record and the judgment of the Trial Court was affirmed.

## CORPORATION MEDICINE.

In a decision by Judge Samuel R. Blake of the Superior Court of the State of California in and for the County of Los Angeles in the case of the people of the State of California on the relation of Granville MacGowan, plaintiff, *vs.* Medical Service Corporation, defendant, recently rendered a decision from which we are taking several points that may have a bearing on the practice of pharmacy.

Judge Blake concludes that a corporation cannot practice medicine. He said that if in the last analysis corporations are allowed to practice medicine as a general proposition it is the opening wedge to the commercialization of the practice of the learned profession of medicine and permits the creeping in of many unethical and uncontrollable factors which the law has heretofore rigidly sought to avoid. He states that one of the main objections to allowing a corporation to practice medicine would be unquestionably the inability of the state to control the practice of medicine by a corporation as it does control it now under the Medical Practice Act, as each member of the profession comes directly under the Medical Practice Act and the corporation herein does not. Unprofessional conduct on behalf of the corporation could not be reached, such as aiding or betraying a professional secret, advertising, or offenses involving moral turpitude, and many others too numerous to mention.

He states finally, unquestionably if the corporation does not come within the provisions of the Medical Practice Act it would be immune from its penalties or provisions; therefore, it is important to the welfare of the people of the State of California, and hence the importance of the prohibiting of a corporation from practicing medicine as a corporation and engaging in that business through its agents for profit.

It seems from the evidence that the defendant corporation is engaged in the business of conducting dispensaries throughout the city of Los Angeles and maintains a principal office. There are six or seven stations where minor injuries not requiring medical attention are treated. Each of these stations has a waiting room where treatment is administered. These stations are enclosed as emergency hospitals and are maintained by the agents of the defendant corporation. In each of the stations the defendant maintains one physician licensed, and these doctors are employed by the corporation on a straight salary and are paid a small bonus if the company makes a profit from his particular station. The evidence shows that the corporation confines its activities to purely and entirely industrial cases. The defendant corporation has no nurse at its branches and the only nurse is at

the main office. The doctors are employed at all times by the company and the physician and surgeon give all of their time to the defendant corporation.

All the doctors are required to report to a chief surgeon at the head office. The corporation makes a charge for the services rendered by the doctor whenever a case is closed. The doctor himself makes no charge and the doctors at various stations are not permitted to treat any private cases of their own and only do the work of the corporation.

### JUDGE HOLDS EIGHTEENTH AMENDMENT INVALID BECAUSE OF ILLEGAL RATIFICATION.

Judge William Clark, of United States District Court of New Jersey, on December 16th handed down a decision in which he held that the Eighteenth Amendment to the Federal Constitution is void, because ratified by state legislatures instead of conventions called in the states for such purpose, since amendments which are designed to transfer to the United States powers reserved to the states, or, if there are any such, to the people, must be ratified by conventions and not legislatures, in view of the character of the delegates to, and the deliberations in a constitutional convention, as compared with the character of the personnel of state legislatures in view of the character of the delegates to, and the deliberations in, a constitutional convention, as compared with the character of the personnel of state legislatures and their deliberations, notwithstanding the language of Article V which provides for ratification by legislatures "or by conventions," since such language can be taken as modified by the principles of political science, and since Congress, in submitting a proposed amendment, acts in an administrative capacity and the submission of the proposed amendment to legislatures instead of conventions constituted an abuse of discretion.—United States *vs.* Sprague, *et al.* (D. C., D. N. J.)

A decision contrary to the conclusion reached by Judge Clark was handed down on Jan. 5th by the Circuit Court of Appeals for the Second Circuit by a unanimous opinion written by Circuit Judge Manton. Counsel for the defendant in this case announced that an appeal would be sought from the decision to the Supreme Court. The appeal from Judge Clark's decision was taken directly to the Supreme Court, under provisions of the Judicial Code, without the usual intermediate appeal to a Circuit Court of Appeals.

### DENATURED ALCOHOL.

Effective January 1, 1931, completely denatured alcohol formula No. 5 is to be compounded as follows:

To every 100 parts by volume of ethyl alcohol of not less than 160° proof, add:

1 part by volume of the compound, or one similar thereto, known as aldehol grade A.

1.25 parts by volume of the compound, or one similar thereto, known as alcotate.

Compounding of completely denatured alcohol under formula No. 1 was suspended, effective January 1, 1931.

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### GERMAN APOTHECARIES' SOCIETY.

The N. Y. German Apothecaries' Society has elected the following officers: *President*, Otto P. M. Canis; *First Vice-President*, Carl Benkendorfer; *Second Vice-President*, Waldemar Nemser; *Recording Secretary*, Eugene Dutz; *Treasurer*, Paul Wellenberger; *Archivist and Librarian*, Carl F. Schleussner; *Counsellor at Law*, Hieronimus A. Harold; *Society's Chemist*, Friedrich Klein; *Members of Executive Committee* (Trustees), Carl F. Schleussner, Frederick Schaefer, Robert S. Lehman.

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## BOOK NOTICES AND REVIEWS.

*Handbuch der Pharmakognosie.* By A. TSCHIRCH. Second Edition. Parts I–V have been issued. Price, each part, 8 marks. Bernard Tauchnitz, Leipzig, 1930. The completed work will represent about 30 parts.

It is now more than fifteen years since the first parts of the comprehensive work bearing the above titles were issued and although apparently brought to completion in 1917, owing to conditions caused by the War the final parts were not made available in this country until 1920. When the first edition was completed favorable comment was made and the author congratulated on the completion of so stupendous a task. It now seems opportune, when the second edition is nearing completion, on which so much time and labor have been bestowed, that it should be brought more generally to notice in order that the work may receive a wider recognition and

appreciation which it merits. Those not acquainted with the work may secure a descriptive circular from the publishers or obtain Part I for inspection.

In the preparation of the second edition the first serves a useful purpose in the revision, enhanced, because of the fact that Dr. Tschirch has secured the collaboration of a corps of scientists, each author an expert in the work with which he deals. The revision may be termed a new edition, because the revision has been done so thoroughly and there is much new material. We note Prof. P. Casparis, well-known for his numerous researches on the chemical constituents of drugs, has undertaken the revision of this section. Prof. Eduard Fischer (Bern) that of the diseases of plants; pharmacist H. Kutter (Flavil) those of animals; Dr. H. Flück (Zurich) contributes an article on micro-photography. Dr. E. Gilg (Berlin), a former collaborator with Engler, assists with his knowledge of botany; Dr. W. Himmelbaur (Vienna) who with Prof. de Graaff (Utrecht) has taken an active interest in the establishment of an international association for promoting the cultivation of medicinal plants, deals with this subject. Dr. J. A. Häfliger (Basel), devotes his attention to the historical section. Dr. L. Winkler (Innsbruck), a specialist in animal drugs, has undertaken the extension and revision of this section. Pharmacist Teofil Tugendhold (Lodz) writes on duties and price schedules. The chapter on drug business and drug packaging is taken care of by Julius Grossmann (Hamburg). A new chapter dealing with pharmacocytology and genetics has been prepared by Dr. P. Schurhoff (Berlin). Dr. Edmund von Lippmann, who contributed to the first edition, is also engaged on this revision; he is well known for his writings on the history of chemistry. Dr. A. von Lingelsheim (Breslau) writes on substitution and adulteration, and Dr. L. Kofler (Innsbruck) on the pharmacology of drugs. A new addition is the chapter on "Homeopathy" in which quite a number of medicinal plants are described.

It is impossible, within the limits of these pages, to undertake a comprehensive review of a work of such magnitude. A general outline will, therefore, have to suffice.

The first volume of the "Handbuch" is devoted to general pharmacognosy and under this title the following subjects are considered: Definitions and aims of pharmacognosy, culture and collection of medicinal plants, trade routes in ancient and modern times; treatment of drugs at the port of entry, and the extent of their production and export; commercial sorting and packing; pharmacognostical systems and bibliography; instruction in pharmacognosy; examination of drugs for identity and purity and their preservation; description of drugs; the auxiliary sciences, such as botany, zoölogy, chemistry, physics, geography and history in their application to the study of pharmacognosy. It may safely be stated that the subject of pharmacognosy in all of its connections has not received so elaborate an exposition as in the "Handbuch." It need not be told that Professor Tschirch is an outstanding authority on the subject, resulting from his long experience; his illustrative and instructive methods are known to all who are interested in the subject of pharmacognosy in its broadest aspects or applications.

Every subject is comprehensively treated and, as far as possible, illustrated. We are quoting another reviewer in the following:

"The section on the cultivation and collection of medicinal plants is, in particular, especially interesting; it is arranged according to countries, illustrated by numerous maps and plates and accompanied by lists of the plants grown in various districts. The question of the profit that may be expected is gone into thoroughly, the general conclusion being that those medicinal plants for which there is a demand, when grown in small quantities, give a higher return than average agricultural produce. In view of the attention now being given to the cultivation of medicinal plants and the difficulty experienced in this country in the past in marketing small parcels, this section is deserving of careful consideration. It gives an admirable survey of the extent and distribution of the industry, and is accompanied by numerous literary references, particularly subsequent to the establishment in Paris of the Comité Interministeriel des Plantes Medicinales et a Essences. If the congresses on this subject that have recently been held result in the establishment of a central station for experiments in the possibility of obtaining by selection, hybridizing, or other means medicinal plants of maximum activity and of controlling them by botanical, chemical or other means, a new era for plant cultivation may be opened."

The illustrations are fine and informative.